EUROPEAN INFORMATION SERVICES INDUSTRY

ANALYSIS FORECAST, 1984 - 1989

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EUROPEAN INFORMATION SERVICES INDUSTRY ANALYSIS FORECAST, 1984-1989

EUROPEAN INFORMATION SERVICES INDUSTRY
ANALYSIS AND FORECAST, 1984-1989

ABSTRACT

This report examines the status and growth potential of the information services industry in the four major Western European markets--France, Italy, the United Kingdom and West Germany.

INPUT defines the information services industry as consisting of four major sectors-- processing services, software products, professional services, and integrated systems.

Each of these sectors is examined in respect of major industry trends and issues identified by both vendors and users. An estimate of the size of each country market is given together with growth rate predictions through 1989. Factors that are affecting this growth, both positively and negatively, are described.

Additionally, the report analyses the economic and strategic position of the information services industry in Western Europe in comparison with the United States. User expeditures on data processing and user expectations for future development are also examined.

This report contains 221 pages, including 68 exhibits.

EUROPEAN INFORMATION SERVICES INDUSTRY
ANALYSIS FORECAST, 1984-1989

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EUROPEAN INFORMATION SERVICES INDUSTRY
ANALYSIS FORECAST, 1984-1989

EXHIBITS

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I INTRODUCTION

I INTRODUCTION

A. SCOPE OF THE REPORT

- The information services industry continues to develop at a fast rate in comparison to the overall rates of economic growth experienced by the principal Western European economies.

- INPUT, in this report, has set out to track the growth and development of this industry in Western Europe.

- In preparing this report INPUT has had two major aims:

  - To describe and review the state of the information services market in Western Europe during 1984 and to present a medium and longer term forecast through to 1986 and 1989 respectively.

  - To highlight and discuss the strategic issues for vendors operating in these markets.

- For this report INPUT has analysed the four major Western European markets of France, Italy, the United Kingdom and West Germany. The term Western Europe is used throughout this report to imply these four individual countries as a group.

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- This report was produced by INPUT as part of its 1984 European Market Analysis and Planning Service (MAPS/E) for the information services industry.

- Enquiries and comments are invited by INPUT regarding this report and any related topics of interest.

- INPUT would like to express its thanks to all those companies and individuals that participated in the research programme undertaken for this report.

B.   METHODOLOGY

- This report is principally based upon three specific research programmes conducted by INPUT in the course of 1984:

  - A vendor research programme.

  - A user research programme.

  - INPUT's continuous research into the information services industry in Western Europe.

- For the vendor research programme 43 in-depth face-to-face interviews were conducted in the four Western European countries included in the study, France, Italy, the U.K. and West Germany. Additionally 13 further vendor respondents were obtained through a mail questionnaire.

- Efforts were made to include as wide a cross section of information services vendors as possible with a bias towards the larger leading edge organisations.

- The questionnaire used for the vendor research programme is included as Appendix C.

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- The user research programme was carried out entirely through the medium of a mail questionnaire in the four countries included in the study. The questionnaire is included as Appendix D.

- Altogether some 64 user questionnaires were returned out of a total mailing of 2,600, representing a return rate of 2.5%.

- An analysis of both the vendor and user sample is included as Appendix B.

- The third element in the research efforts that contributed to this report was INPUT's continuing studies of the information services industry.

- Previous studies by INPUT of the market, company statements, press releases, news reports and company financial information were all utilised by INPUT in researching this report.

- Individual country markets were assessed in local currency at current rates.

- For comparative purposes the assessments of individual country markets for 1983 have been converted into U.S. dollars at the following conversion rates:

  - 8.66 French Francs per dollar.

  - 1,730 Italian Lira per dollar.

  - 0.75 pounds sterling per dollar.

  - 2.82 Deutsche Marks per dollar.

- For market forecast comparisons through to 1989, conversion rate adjustments have been made in order to eliminate the distorting effect of differing inflation assumptions.

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- These assumptions and the conversion rates used are described fully in Chapter III, section A, in particular reference Exhibit III-I.

- Definitions of the terms used in this report are included in Appendix A.

C.   REPORT STRUCTURE

- The remaining chapters of this report are organised as follows:

    - Chapter II is an executive summary providing an overview of the contents of the entire report.

    - Chapter III describes INPUT's assessments of the size of the information services market and its main constituent sectors, current and predicted growth rates and forecasts for the medium and longer term.

    - Chapter IV assesses some of the major strategic issues that are of concern to and are likely to affect the development of the information services business. Three major areas are addressed:

        . The economic background.

        . The changing competition.

        . The telecommunications environment.

    - Chapter V discusses further issues and analyses that are of importance to the information services market. These are described under the broad classification of vendor and user issues.

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-       Chapter VI to IX provide more detailed analyses of each of the four main sectors of the information services defined by INPUT, respectively:

- Processing services in Chapter VI.

- Software products in Chapter VII.

- Professional services in Chapter VIII.

- Integrated systems in Chapter IX.

-       The appendices provide a definition of the terms used, the interview and sample profile, the questionnaires used and a list of related INPUT reports.

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II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- This executive summary is designed in a presentation format in order to:

    - Help the busy reader quickly review key research findings.

    - Provide a ready-to-go executive presentation, complete with script to facilitate group communication.

- The key points of the entire report are summarised in Exhibits II-I through II-8. On the left-hand page facing each exhibit is a script which expands on the summarised points listed in the exhibits.

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A. WESTERN EUROPEAN INFORMATION SERVICES MARKET TO EXCEED $28 BILLION BY 1989

- The overall market will grow from just under $10 billion in 1984 at an average annual growth rate (AAGR) of 22% to reach nearly $15 billion by 1986. Between 1986 and 1989 it is forecast that the market will expand at an AAGR of 24% to exceed $28 billion.

- The software products sector will show the fastest growth, an AAGR of 32%, that will take this sector from 26.5% of the overall market in 1984 to 36.9% in 1989.

- Processing services will be the slowest growing sector at an AAGR of 11% between 1984 and 1989. As a result this once dominant sector of the processing business will only represent 15% of the market by 1989, having dropped from 26.8% in 1984.

- The professional services sector of the business will grow broadly in line with the whole market at an AAGR of 22% and maintain its overall position at around 27% of the market.

- Integrated systems will grow at an AAGR of 26% to reach over $3 billion by 1986 and exceed $6 billion by 1989.

- Each of these sectors is discussed in more detail below.

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EXHIBIT II-1

WESTERN EUROPEAN INFORMATION SERVICES MARKET TO EXCEED $28 BILLION BY 1989

Chart: User Expenditure ($ Billions)

- 1984: $9.7 total — $1.9, $2.8, $2.3, $2.7
- 1986: $14.9 total — $3.1, $4.3, $4.2, $3.3 (AAGR 22%)
- 1989: $28.5 total — $6.3, $8.2, $9.3, $4.7 (AAGR 24%)

Legend:
- Processing Services
- Professional Services
- Software Products
- Integrated Systems

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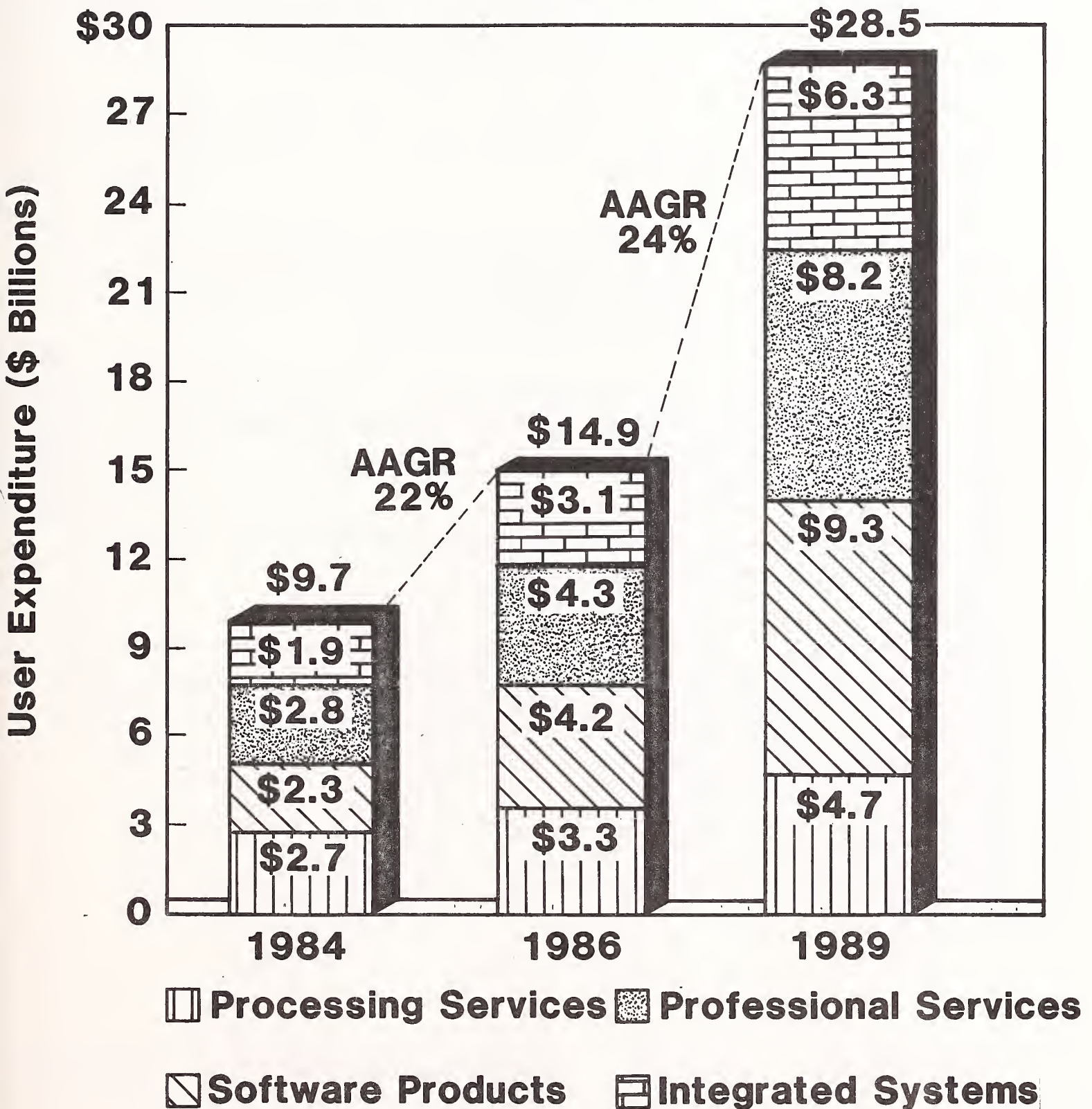
B. FRANCE REMAINS LARGEST MARKET—REACHES $9 BILLION BY 1989

- France will remain the largest individual country market and is expected to grow at an AAGR of 21% to reach $9 billion by 1989.

- The French market has a strong base of large information services companies and users well accustomed to the use of information services.

- The West German market is expected to grow at an AAGR of 25% between 1984 and 1989.

- This market, not well developed from a services standpoint in the past, will increasingly turn to services solutions to meet the challenges of increased complexity and emphasis on information processing.

- It is forecast that the United Kingdom market will achieve a 24% AAGR rate to reach $7.5 billion in 1989. The requirements for specialised services in the banking and finance areas will be particularly important.

- Italy will remain the smallest market through to 1989 when it is expected to reach $4.6 billion.

- Its relative size in comparison to the other three country markets will improve due to an expected high AAGR of 27% spurred by rapid improvements in its telecommunications infrastructure and general use of information technology throughout industry and commerce.

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EXHIBIT II-2

FRANCE REMAINS LARGEST MARKET
– REACHES $9 BILLION BY 1989

Bar chart, Y-axis: $ Billions (0 to $10). X-axis years: 1984, 1986, 1989.

1984: Italy $1.4, West Germany $2.4, U.K. $2.5, France $3.5
1986: Italy $2.3, West Germany $3.7, U.K. $3.9, France $5.1
1989: Italy $4.6, West Germany $7.4, U.K. $7.5, France $9.0

Legend: Italy, West Germany, U.K., France

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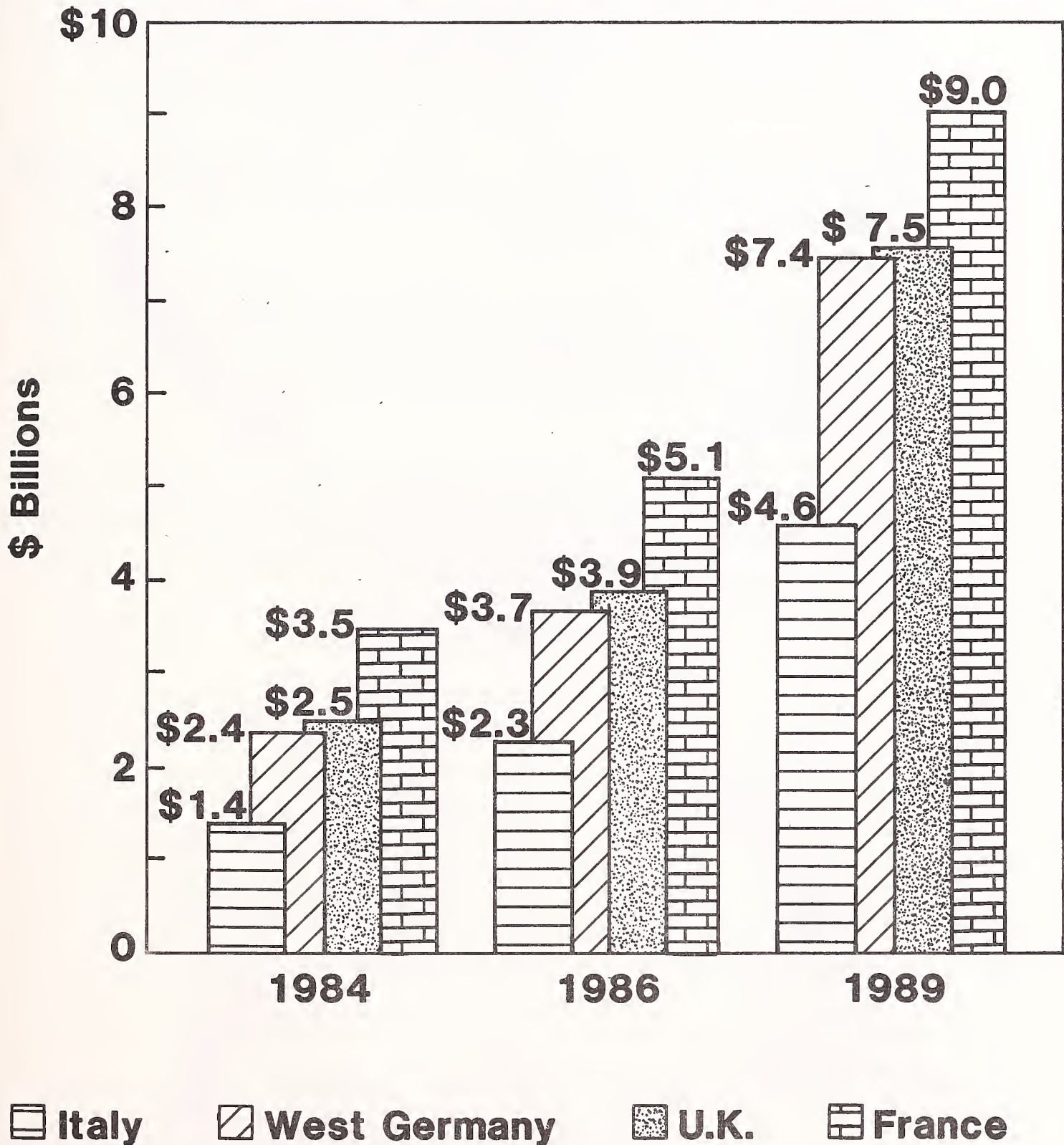
C. CLEAR STRATEGIES ESSENTIAL FOR FRAGMENTED MARKETS

- The widening range of products made possible by continuing technological advance is leading to the development of more and more complex distribution channels.

- Users demanding more and more specific system solutions are providing the demand pull for the creation of highly focussed specialised vendors.

- The growth rates and size of the information services business makes it an attractive target for new competitors.

- The onward drive of information technology as an essential component of business activity is also leading to the arrival of new competitors in the information services business--for example, in the area of financial information distribution.

- The continued shift towards services throughout the economy and in particular within the information systems business also leads to the introduction of new competitors, notably the hardware manufacturers and electronics companies.

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EXHIBIT II-3

CLEAR STRATEGIES ESSENTIAL
FOR FRAGMENTED MARKETS

Technology

New Competitors

**Information
Services
Markets**

**Specific
System
Solutions**

Complex Distribution Channels

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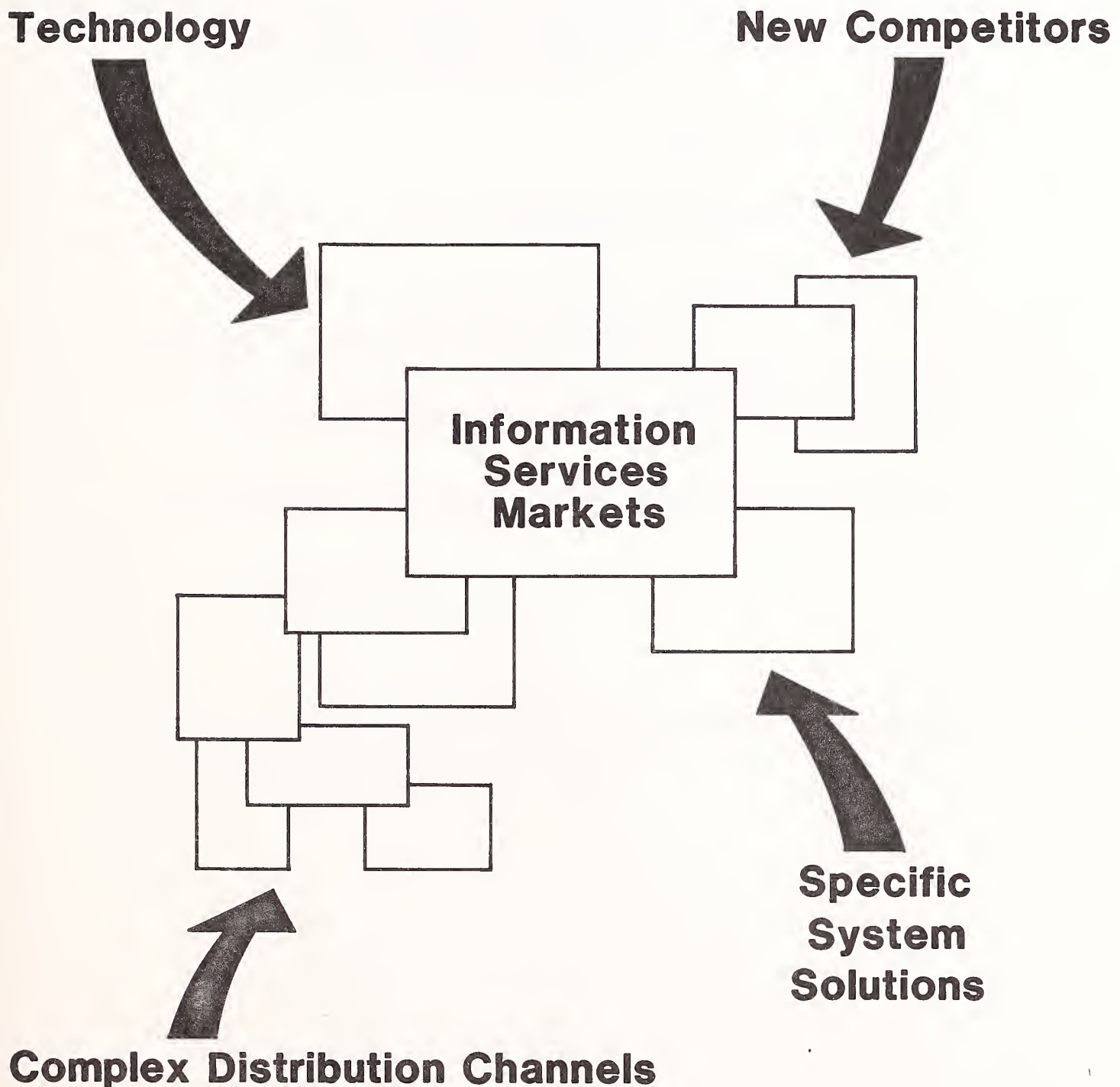
D.   VALUE-ADDED KEY TO SUCCESSFUL PROCESSING SERVICES

- On-line database services have emerged as the fastest growing subsector within processing services. Completely new competitors, e.g., Reuters and Dun & Bradstreet, have emerged onto the scene. Key to success in on-line database markets is adding value to data to transform it into valuable, timely information.

- Value-added network services (VANs) represents a key opportunity to exploit the convergence of data processing and communications:

    - Building networks.

    - Providing EII/EDI.

    - Meeting increased needs for international communications.

- Full service offerings and the provision of more complex applications are a major feature of successful service bureau operations.

- The ultimate value-added processing service is facilities management.

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EXHIBIT II-4

VALUE-ADDED KEY TO SUCCESSFUL PROCESSING SERVICES

- **The Emerging Importance of On-Line Database Markets**

- **VANs a Key Opportunity**

- **Full Service Offerings**

  - **Software**

  - **Consultancy**

  - **Training**

- **Facilities Management, the Ultimate Processing Service**

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E.   QUALITY AND SERVICE: MAJOR CHALLENGES FOR SOFTWARE VENDORS

- Software product markets are currently experiencing rapid growth, but this is expected to decline within the next three years as the markets become saturated.

- Marketing is a major emphasis at the moment as vendors seek positioning in an overcrowded marketplace.

- Users are becoming more demanding of software products, their documentation and associated support and service functions.

- Vendors must place more emphasis on product quality and must augment products with full service offerings:

    - Consultancy.

    - Training.

- Vendors must place more emphasis on value pricing which implies a strong identification between the software product and the system solution.

- Value pricing is the key to profitability.

- Competition with manufacturers will be met by:

    - Joint agreements.

    - Selection of market niches.

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EXHIBIT II-5

QUALITY AND SERVICE: MAJOR CHALLENGES FOR SOFTWARE VENDORS

- **Rapid Growth Will Decline as Markets Saturate**

- **Marketing a Major Emphasis**

- **Increasing User Demands**

- **Vendors Must Emphasise**

  - **Quality of Products**

  - **Full Service Concept**

- **Value Pricing Key to Profitability**

- **Market Selection and Agreements Important for Independents Future**

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F.   INFORMATION SYSTEMS COMPLEXITY DRIVING PROFESSIONAL SERVICES GROWTH

- The increasing complexity of information systems is presenting users with a two-pronged challenge:

    - A bewildering array of products and systems from which they must select for their own organisations.

    - The increasing necessity to optimise their use of information technology in order to maintain their competitive position.

- User organisations are turning increasingly to professional services organisations for consultancy and customised system development to meet these challenges.

- Shortage of skilled staff is the major concern that could limit continued strong growth in professional services.

- Vendors will turn increasingly towards system development methods, fourth-generation languages and other measures to increase productivity and profitability.

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EXHIBIT II-6

INFORMATION SYSTEMS COMPLEXITY DRIVING PROFESSIONAL SERVICES GROWTH

- Increasing System Complexity:

    - Product/System Confusion

    - Strategic Position of Information Technology

- Increasing Demand for:

    - Consultancy

    - Custom System Development

- Skills Shortage Major Concern

- Productivity Methods Essential to Growth and Profitability

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G.   SPECIALISATION STRATEGIES VITAL FOR INTEGRATED SYSTEMS

- As hardware costs continue to erode, the industry is learning to adapt to:

    - High-volume low-cost production.

    - Lengthy and costly R&D.

- Major manufacturers are adopting the system integrator role to meet these challenges and maintain state-of-the-art product offerings.

- At the same time the lower cost of hardware raises the potential profit for system integrator operations making it an attractive target for new entrants.

- User demand for integrated systems will remain buoyant fuelled by the need for "specific" solutions that provide "surprise-free" implementation.

- Specialisation strategies will be vital for vendors to achieve competitive differentiation. Vendors must develop and emphasise:

    - Unique product benefits, primarily in the software applications.

    - Additional service elements to augment the overall product offering.

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EXHIBIT II-7

SPECIALISATION STRATEGIES VITAL FOR INTEGRATED SYSTEMS

- **Hardware Cost Erosion Increases Importance of:**

  - **High-Volume/Low-Cost Production**
  - **R&D Investment**

- **System Integration Is Both More Attractive and More Necessary for Manufacturers**

- **High User Demand for Integrated System Products Is Fuelled by Need for:**

  - **Specific System Solutions**
  - **'Surprise-Free' Implementation**

- **Specialisation Strategies Can Differentiate Vendors From Competitors**

- **Development and Emphasis of:**

  - **Unique Product Benefits**
  - **Additional Service Elements**

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H.   SERVICES EMPHASIS—THE EXTRA DIMENSION

- It is becoming more and more necessary for all information services vendors to augment their core products with additional service elements.

- These will provide differentiation from competitors and create effective barriers of entry to new entrants who cannot build up competitive services in a short time period.

- Additional services are the extra dimension.

- Information service vendors should emphasise the strengthening of three fundamental components of their business:

    - Their technical excellence, particularly in terms of people skills.

    - Their marketing professionalism, ensuring a viable position in a crowded and fragmented market.

    - Their financial strength to sustain effective research and development, attract high quality professional staff, and meet increasingly higher marketing costs.

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EXHIBIT II-8

SERVICES EMPHASIS – THE EXTRA DIMENSION

- **Services Augmentation for Core Products Provide:**

  - **Competitive Differentiation**

  - **Barriers to New Entrants**

- **Information Services Vendors to Emphasise:**

  - **Technical Excellence**

  - **Marketing Professionalism**

  - **Financial Strength**

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III MARKET ANALYSIS AND FORECAST

III   MARKET ANALYSIS AND FORECAST

A.   MARKET STRUCTURE

- The Western European information services market was researched during 1984, data from previous INPUT research was also considered, and the market was then forecast for the five-year period 1984-1989. Market development for the 1983-1984 period was evaluated from face-to-face in-depth interviews with leading vendors in the information services business and supported by the collection of other public domain information.

- The processing services market was forecast by a number of submodes which included interactive processing, database enquiry and batch processing.

- Software products were forecast:

    -    By system and application packages.

    -    By both independent suppliers and hardware vendors.

- Professional services were forecast for the following categories:

    -    Consultancy.

    -    Software development.

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- Education and training.

- Contract programming and other professional services.

- For integrated systems the forecasts were made by:

  - Hardware revenues.

  - Software and other charges.

- Western Europe is defined in this report as consisting of the four major individual country markets of France, Italy, the United Kingdom and West Germany.

- It is estimated that these four countries account for between 60 and 65% of the entire Western European information services industry.

- The forecasts are made in local currency and converted into U.S. dollars for aggregation and comparative purposes.

- The forecasts include assumptions about the rate of inflation in each country as follows:

  - France - 9% per annum.

  - Italy - 10% per annum.

  - United Kingdom - 5% per annum.

  - West Germany - 3% per annum.

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- In order to maintain a fair comparison between the different country markets throughout the five-year forecast period the U.S. dollar conversion rates have been adjusted in line with the assumed differences in inflation rates.

- U.S. inflation was assumed to be 5% per annum.

- Exhibit III-1 sets out the assumed conversion rates used in preparing this forecast.

- In no regard should the conversion rates set out in Exhibit III-1 be considered as a forecast of exchange rates. They are calculated on the basis of prevailing exchange rates and used simply as an index to eradicate distortions that would otherwise arise as a result of the use of different inflation assumptions for different countries.

B. FORECASTS FOR INFORMATION SERVICES, 1984-1989

- INPUT forecasts that the Western European information services market will grow from $9.8 billion in 1984 to nearly $15 billion in 1986. This represents an annual average growth rate (AAGR) of around 22%.

- In the longer term INPUT forecasts that between 1986 and 1989 this market will continue to grow at an average annual growth rate of around 24% to reach over $28 billion.

- Exhibit III-2 shows the breakdown of these market size and growth projections for the four individual country markets studied in this report.

- Exhibit III-3 shows the breakdown over the four major sectors which INPUT includes within its definition of the information services industry.

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EXHIBIT III-1

DOLLAR CONVERSION RATE ASSUMPTIONS

CURRENCY	U.S. DOLLAR CONVERSION RATES USED			
	1983	1984	1986	1989
French Francs	8.66	9.03	9.77	10.99
Italian Lira	1,730	1,826	2,013	2,330
Pounds Sterling	0.75	0.79	0.79	0.79
Deutsche Marks	2.82	2.94	2.82	2.66

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EXHIBIT III-2

FORECAST OF INFORMATION SERVICES MARKET BY COUNTRY
1984–1989
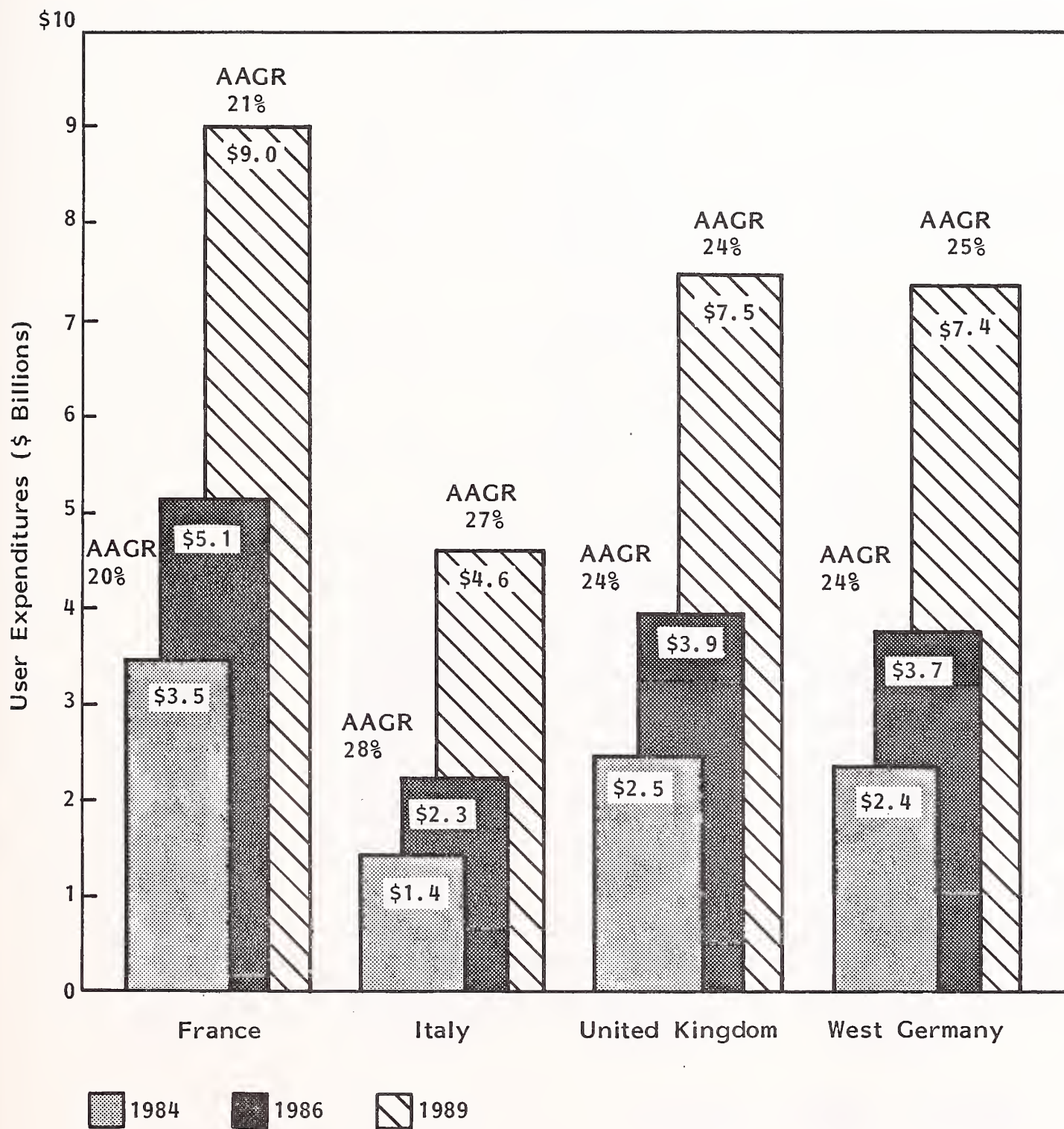
EXHIBIT III-3

FORECAST OF INFORMATION SERVICES MARKET BY MARKET SECTOR

1984-1989
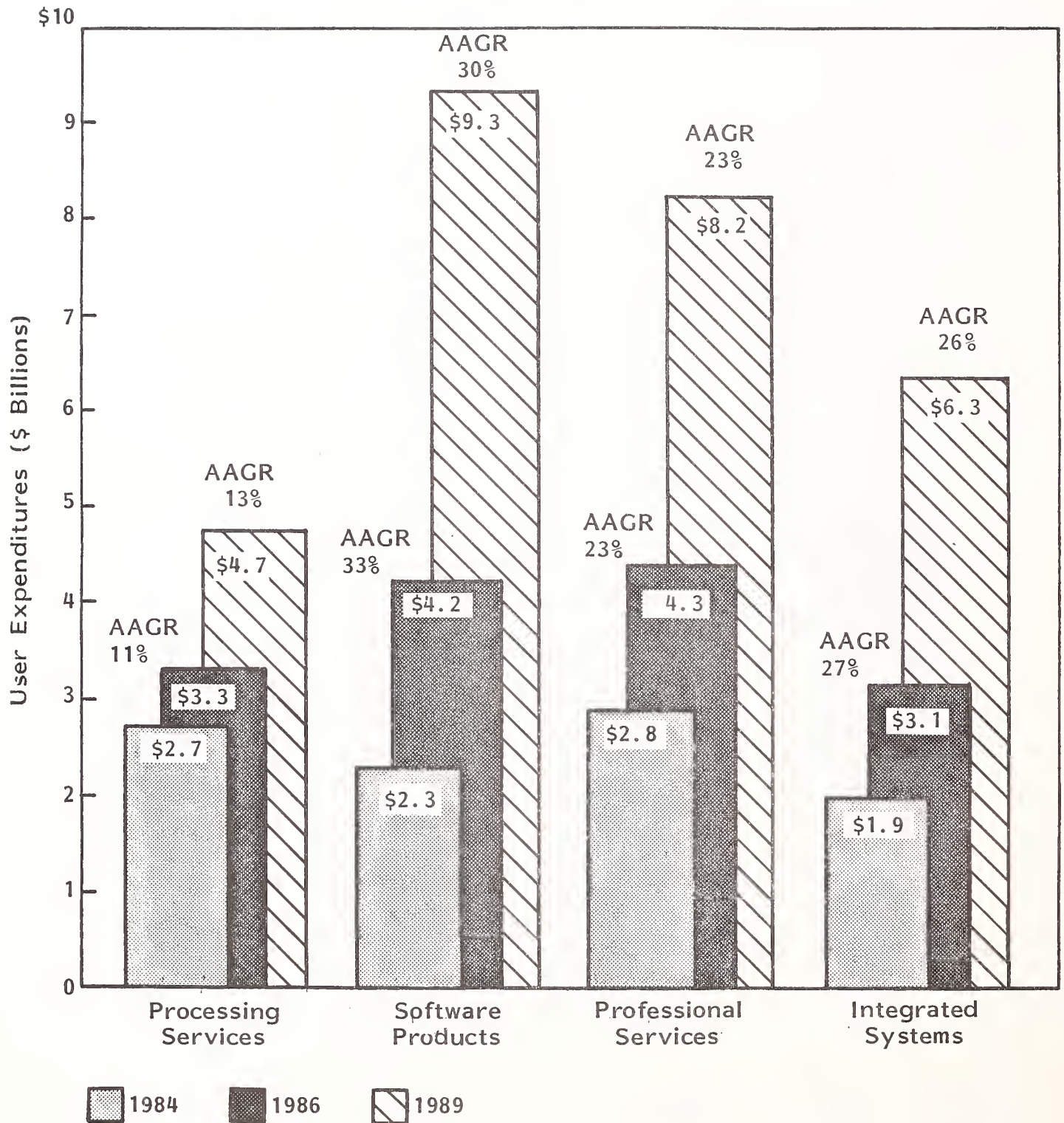
- It is forecast that by 1989 the largest sector will be software products with the professional services sector in second place.

- Processing services, which hitherto has been the largest of the four sectors, is relegated to second place by professional services in 1984.

- Exhibits III-4 and III-5 show, respectively, individual country and market sector growth forecasts through 1986 to 1989.

- The market development of the four major market sectors--processing services, software products, professional services and integrated systems--is discussed in Sections B of Chapter VI through Chapter IX respectively.

- The development of each individual country market in relation to this forecast is discussed in the subsections below.

1. FRENCH MARKET DEVELOPMENT

- The French market for information services is the largest and strongest individual country market in Western Europe.

- It is forecast that France will remain the largest single market but that its share of the Western European market will have fallen from over 35% in 1983 to just 32% by 1989.

- Stronger services growth in the other countries, particularly West Germany, will be responsible for this relative decline.

- The centralised nature of the French economy and particularly strong government support (through development programmes and direct aid) have developed a strong information services business.

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EXHIBIT III-4

COMPARISON OF INFORMATION SERVICES MARKETS
BY COUNTRY IN WESTERN EUROPE
1983-1989

COUNTRY	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
France	$2,938	$3,495	20%	$5,075	·21%	$9,034
Italy	1,080	1,379	28	2,257	27	4,589
United Kingdom	2,149	2,515	22	3,886	24	7,457
West Germany	2,104	2,429	21	3,730	25	7,378
Total	$8,271	$9,818	22%	$14,948	24%	$28,457

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EXHIBIT III-5

COMPARISON OF INFORMATION SERVICES MARKETS
BY MARKET SECTORS IN WESTERN EUROPE
1983-1989

MARKET SECTOR	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Processing Services	$2,512	$2,675	10%	$3,316	13%	$4,746
Software Products	1,801	2,345	32	4,162	31	9,256
Professional Services	2,393	2,851	22	4,337	23	8,169
Integrated Systems	1,565	1,947	26	3,133	26	6,286
Total	$8,271	$9,818	22%	$14,948	24%	$28,457

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- The structure of the French industry is thus more developed than in other European countries with the top ten companies all exceeding $50 million in annual revenues during 1983.

- Between 1982 and 1983 the top ten services companies' annual revenues grew by 20%.

- During 1983 the top four French information services vendors all generated revenues in excess of $100 million.

- Cap Gemini Sogeti grew at nearly 37% during 1983 to achieve annual revenues of $168 million and overtake CISI to become the largest French services company.

- Exhibit III-6 shows the breakdown of the French information services market between the four major constituent sectors.

- It is predicted that the software products sector will show the highest growth to represent nearly 26% of the market by 1989 compared to only 18% in 1984.

- Traditionally the French have been more reluctant to take up packaged software solutions, preferring to develop or purchase customised systems.

- This is expected to change as a result of several factors:

    - The increasing difficulty of obtaining staff to develop customised solutions and the consequent pressure to adopt a package solution.

    - The proliferation of microcomputers within large corporations and smaller business.

    - Increasing availability of software package products produced specifically for the French market.

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EXHIBIT III-6

FORECAST FOR INFORMATION SERVICES MARKET IN FRANCE
1984-1989

MARKET SECTOR	MARKET FORECAST (French Francs (FF) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Processing Services	7,992 FF	9,007 FF	14%	11,701 FF	14%	17,402 FF
Software Products	4,331	5,901	36	10,782	33	25,473
Professional Services	8,273	10,249	25	15,954	25	31,257
Integrated Systems	4,850	6,410	32	11,148	31	25,153
Total	25,446 FF	31,567 FF	25%	49,585 FF	26%	99,285 FF

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- An additional factor will be the continuing efforts of the major hardware manufacturers to increase their sales of both system and applications software products.

- The performance of the French economy and general business confidence remain concerns for the future development of the information services markets.

2. ITALIAN MARKET DEVELOPMENT

- The Italian market for information services has suffered from relative under-development in comparison with the other major European countries as a result of a number of factors. Principally, these factors include:

  - Poor telecommunications infrastructure.

  - Lack of government support for the industry, both in terms of direct financial support and the optimisation of government contract placements.

  - A lack of direct investment in the information services industry by major industrial and commercial groups.

  - The consequent small number of substantial vendors complemented by large numbers of very small undercapitalised companies.

  - Low acceptance of the need for modern management techniques and the application of computers within business and commerce. Data processing tends to be a centralised function within organisations with an emphasis on in-house development.

  - Slow economic growth and high inflation.

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- The division within Italy between the industrialised north and the predominately rural south.

- These factors have contributed to the existing structure of the Italian processing services market, which is dominated by the captive business derived from the principal commercial groups and government agencies.

- It is now apparent that the Italian market is beginning to develop more rapidly as a more dynamic attitude is being adopted to the utilisation of modern communications and computer technology.

- The dominant captive revenue groups like ENIDATA and DATAMONT are placing much emphasis on the growth of their open market business.

- Within the communications area considerable efforts are being made to improve the infrastructure including:

  - Wider geographic availability and additional services on the circuit-switched data network RFD (Rate Fonia Dati) specifically oriented to data transmission.

  - The introduction of the VIDEOTEL videotex service on a broad basis following the current pilot operation located in Milan.

  - The availability of ITAPAC, the Italian public packet-switched network service during 1985.

- The recent joint venture agreement between IBM and STET, the state-owned manufacturer of communications equipment, is further evidence of increased interest by the Italian authorities in improving the communications infrastructure.

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- User attitudes towards the use of data processing are maturing and some sectors of the economy are investing heavily in new technology, notably banking and manufacturing.

- In the banking area, investment in new technology is increasing rapidly--in particular the use of an interbank data transmission network and the widening installation of ATM's.

- In the manufacturing area major corporations, particularly FIAT, are making significant investments in CAD/CAM and other automation projects.

- It is anticipated that many joint agreements, and possibly mergers, will take place to form stronger, more effective groups within the information services industry.

- With inflation falling to around 10% per annum and economic growth restored the outlook for the Italian information services market is very positive.

- INPUT forecasts that the Italian market will grow at a rate in excess of 30% per annum to reach over 10,000 billion lira by 1989.

- This growth and that of the individual market sectors is summarised in Exhibit III-7.

3.   UNITED KINGDOM MARKET DEVELOPMENT

- The United Kingdom will remain a strong market for information services throughout the forecast period of this study.

- Particular areas of strength are in the on-line database markets, fueled by the demand for financial information services in the City of London, and in microcomputer software driven by high acceptance of personal computers.

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EXHIBIT III-7

FORECAST FOR INFORMATION SERVICES MARKET IN ITALY
1984-1989

MARKET SECTOR	MARKET FORECAST (Lira (£) Billions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Processing Services	£ 632	£ 743	19%	£1,054	21%	£ 1,868
Software Products	491	719	47	1,495	37	3,820
Professional Services	368	508	38	956	38	2,502
Integrated Systems	379	549	40	1,039	34	2,504
Total	£1,870	£2,519	34%	£4,544	33%	£10,694

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- The forecast market development is shown in Exhibit III-8 with an annual average growth rate of 24% during the period up to 1989.

- While growth rates in the software products, professional services and integrated systems markets are expected to decline in the latter half of the study period, processing services growth is expected to increase considerably.

- This growth will be driven largely by a considerable increase in the use of value-added network services (VANs).

- VANs development in the United Kingdom is expected to be particularly strong as a result of the more open and competitive telecommunications environment that has been created, in contrast to other European countries, by the privatisation of British Telecom.

- The software products sector is currently experiencing very high growth, partly as a result of the boom in personal computers.

- A major factor behind high levels of packaged software in the United Kingdom is the wide choice and availability of products. The U.K. represents a natural first step for U.S.-based software companies expanding into Europe and consequently U.S. software products are often available earlier in this market than in the countries of continental Europe.

4. WEST GERMAN MARKET DEVELOPMENT

- West Germany, although the largest computer equipment market in Europe, has been characterised by an underdeveloped information services business.

- Services have long been regarded as largely a stop-gap, the primary objective has always remained to carry out data processing work in-house.

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EXHIBIT III-8

FORECAST FOR INFORMATION SERVICES MARKET IN UNITED KINGDOM
1984-1989

MARKET SECTOR	MARKET FORECAST POUNDS (£) Millions					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Processing Services	£ 432	£ 461	10%	£ 581	15%	£ 893
Software Products	366	497	33	866	29	1,866
Professional Services	521	654	26	1,040	24	1,987
Integrated Systems	293	372	26	583	25	1,145
Total	£1,612	£1,984	24%	£3,070	24%	£5,891

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- Two other significant characteristics of the West German marketplace are:

    - The domination of IBM standardisation, with even its major home-based independent manufacturer Siemens being IBM compatible.

    - Its relatively expensive and restricted communications environment.

- Exhibit III-9 shows the forecast for the growth of the West German market through to 1989.

- INPUT anticipates that strong growth will occur in this market in the period under study and that growth between 1986 and 1989 will be at a higher rate than that before 1986.

- The major driving force behind this growth will be a change in attitude of German users towards a greater acceptance and use of the services approach.

- An important manifestation of this is the trend among major DP users with significant programming and systems analyst staff to create service subsidiaries.

- For example, Motoren und Turbinen Union (MTU), the leading West German jet aircraft engine supplier, has founded MTU-Informations Systeme to sell its own manufacturing control product on the open market.

- The general trends in the marketplace, referred to elsewhere in this report, of increasing complexity in information technology coupled with stronger and stronger economic reasons for its utilisation, will also have a strong impact on the West German market.

- Another contributory factor will be the improved telecommunications environment. The introduction of the videotex system Bildschitmtext and the offering of a digitally-switched model network with 64K bits per second

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EXHIBIT III-9

FORECAST FOR INFORMATION SERVICES
MARKET IN WEST GERMANY
1984-1989

MARKET SECTOR	MARKET FORECAST (Deutsche Marks (DM) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Processing Services	1,830 DM	2,020 DM	10%	2,428 DM	11%	3,276 DM
Software Products	1,493	1,968	30	3,438	32	7,813
Professional Services	1,497	1,785	20	2,574	22	4,617
Integrated Systems	1,115	1,370	23	2,081	24	3,920
Total	5,935 DM	7,143 DM	21%	10,521 DM	23%	19,626 DM

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stations as a bridge towards the full implementation of the ISDN are impor-
tant developments.

C.   COMPETITIVE ENVIRONMENT

- Detailed research and analysis of published accounts of leading service
  companies and other information has enabled INPUT to establish rankings of
  these vendors by:

  - Overall revenues in calendar 1983.

  - Revenues in major market sectors.

- A number of adjustments have been made to the vendors' stated revenues in
  order to normalise them for comparative purposes:

  - Captive revenues have been subtracted (see Appendis A for a definition
    of captive revenues).

  - Export revenues have been separated out for markets outside the four
    countries defined here as Western Europe.

  - Where reported results were for noncalendar financial years, an
    adjustment was made.

  - Hardware and hardware maintenance revenues were extracted, unless
    these were associated with an integrated system.

- Exhibit III-10 lists the top 20 information services vendors in Western Europe
  ranked by their estimated market share within the four major country markets
  as a group.

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EXHIBIT III-10

THE TOP TWENTY INFORMATION SERVICES
VENDORS BY 1983 WESTERN EUROPEAN MARKET SHARE

RANK	VENDOR	PERCENT (Rounded)
1	IBM-INS	1.8%
2	CISI	1.4
3	GSI	1.4
4	SG2	1.4
5	Scicon	1.2
6	Cap Gemini Sogeti	1.2
7	Datev	1.2
8	CCMC	0.9
9	GEISCO	0.9
10	Reuters	0.8
11	Sligos	0.8
12	SEMA	0.7
13	Control Data	0.6
14	THORN-EMI	0.6
15	Software AG	0.6
16	Telesystemes	0.6
17	Systime	0.5
18	SESA	0.5
19	Steria	0.5
20	Hoskyns	0.5

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- The overall fragmented nature of the market is clearly illustrated by the relatively small individual market shares achieved by the vendors in the top 20 ranking.

- IBM-INS for example, the market leader, achieved only 1.8% of the combined Western European information services market.

- In total, these top 20 vendors account for 18.1% of the total market.

- The domination of the list by French services vendors is also significant with CISI, GSI, SG2, Cap Gemini Sogeti, and CCMC all appearing within the top ten.

- Exhibit III-11 lists the top ten vendors in each of the four major country markets, and Exhibit III-12 the top ten vendors in each of the four main sectors of the information industry.

D.   COMPARISON WITH THE UNITED STATES MARKET

- The information services market in the U.S. is considerably larger than that of Western Europe, not only in absolute terms but also relative to population size and GNP.

- Many reasons are propounded for this but certainly among the most important factors are:

    -    The very large unified U.S. market in comparison with Western Europe.

    -    Generally lower costs for both computer hardware and software and telecommunications.

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EXHIBIT III-11

TOP VENDOR RANKING AND COUNTRY
MARKET SHARES 1983 — INFORMATION SERVICES

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
FRANCE			ITALY		
1	SG2	3.8%	1	Finsiel	10.2%
2	CISI	3.4	2	ENIDATA	4.3
3	GSI	2.8	3	Data Management	2.4
4	Cap Gemini Sogeti	2.7	4	Datamont	1.8
5	CCMC	2.6	5	Cerved	1.8
6	Sligos	2.2	6	GEISCO	1.7
7	SEMA	2.1	7	Syntax	1.6
8	Telesystemes	1.6	8	Sopin	1.5
9	SESA	1.5	9	GE-DA	1.1
10	GFI	1.4	10	CDS	1.0
U.K.			WEST GERMANY		
1	THORV-EMI	2.2%	1	Datev	4.7%
2	Systime	2.1	2	Taylorix	2.3
3	Hoskyns	1.8	3	Software AG	2.2
4	Reuters	1.7	4	SCS	1.7
5	Centre-File	1.4	5	IBM-INS	1.5
6	IBM-INS	1.4	6	ACI-UCCEL	1.5
7	Scicon	1.4	7	ADV-ORGA	1.1
8	GEISCO	1.3	8	Computervision	1.1
9	SDL	1.1	9	Kienbaum	1.0
10	CAP	1.1	10	GSI (Datel)	1.0

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EXHIBIT III-12

TOP VENDOR RANKING AND SECTOR
MARKET SHARES 1983 – WESTERN EUROPE

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
PROCESSING SERVICES			SOFTWARE PRODUCTS		
1	IBM-INS	5.3%	1	Software AG	1.1%
2	GSI	3.7	2	Cincom	0.6
3	Datev	3.5	3	SEMA	0.5
4	CISI	3.4	4	Scicon	0.5
5	CCMC	2.9	5	CGI	0.5
6	GEISCO	2.8	6	ADR	0.4
7	Reuters	2.7	7	Control Data	0.4
8	SG2	2.1	8	Softlab	0.4
9	Sligos	2.1	9	ADV/ORGA	0.3
10	Telesystemes	1.9	10	Hoskyns	0.3
PROFESSIONAL SERVICES			INTEGRATED SYSTEMS		
1	Cap Gemini Sogeti	3.5%	1	Computervision	3.4%
2	SG2	2.2	2	Systime	2.9
3	Scicon	2.2	3	CALMA	1.7
4	SEMA	1.5	4	Gerber	1.7
5	SESA	1.5	5	Intergraph	1.4
6	Software AG	1.4	6	Arbat	1.1
7	CISI	1.3	7	Taylorix	1.0
8	Syseca	1.0	8	Steria	0.9
9	Kienbaum	1.0	9	Metier	0.9
10	Steria	0.8	10	Applicon	0.8

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- The more developed "service orientation" of the U.S. economy in comparison with Western Europe.

- The more widespread acceptance of information technology.

- Exhibit III-13 provides a comparison between the United States market for information services and that of Western Europe. The recent adverse declines in European currency exchange rates against the U.S. dollar should be taken into account in this comparison.

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EXHIBIT III-13

COMPARISON OF U.S. AND WESTERN EUROPEAN
INFORMATION SERVICES MARKET DEVELOPMENT, 1984-1989

MARKET SECTOR		MARKET FORECAST ($ Billions)			
		1983	1984	1984-1989 AAGR	1989
Processing Services	U.S.	$13.0	$14.0	13%	$ 26.0
	W.E.	$ 2.5	$ 2.7	12%	$ 4.7
Software Products	U.S.	8.0	11.0	31	40.0
	W.E.	1.8	2.3	31	9.2
Professional Services	U.S.	7.0	9.0	20	22.0
	W.E.	2.4	2.8	23	8.2
Integrated Systems	U.S.	4.0	6.0	27	19.0
	W.E.	1.5	1.9	26	6.3
Total	U.S.	$32.0	$39.0	22%	$107.0
	W.E.	$ 8.2	$ 9.7	24%	$ 28.4

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IV STRATEGIC ISSUES

IV   STRATEGIC ISSUES

A.   ECONOMIC BACKGROUND

- Towards the end of the 1970s there was a general tendency to believe that the overall level of demand for information products and services was not greatly affected by the state of the economy.

- Economic recession in Western Europe in the early 1980s has altered this position and information systems vendors are now more cautious and more concerned with the overall performance of the economy.

- This trend is likely to become more pronounced as user organisations spend an increasing proportion of their revenues on information systems and as the overall size of the industry becomes a larger and larger component of the economy.

- Exhibit IV-1 provides some basic economic statistics on the four major Western European countries, and for comparative purposes the United States.

- Whereas within Europe the information services business represents on average only 0.42% of the Gross National Product (GNP), in contrast it has developed to be 1% of GNP in the U.S.

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EXHIBIT IV-1

COMPARATIVE ECONOMIC STATISTICS - 1983

	France	Italy	U.K.	West Germany	Total	U.S.
Gross National Product ($ Billions)	$510	$388	$445	$648	$1,991	$3,250
Current Level of GNP Growth	+1.9%	+1.4%	+2.6%	+0.6%	–	+7.6%
Size of Information Services Business	2.94	1.08	2.15	2.10	8.27	32.60
Percent of GNP	0.58%	0.28%	0.48%	0.32%	0.42%	1.00%
Total Working Population (1982) (Millions)	22.8	22.6	25.9	26.9	98.2	110.2
Total Employed in (1982) Service Industries (Millions)	11.9	10.4	14.5	13.0	49.8	67.7
Percent Service Employees of Total Working Population	52%	46%	56%	48%	51%	61%
Current Inflation Rate (Percent)	+9.3%	+10.5%	+5.3%	+2.6%	–	+3.8%

Source: EUROSTAT and INPUT estimates.

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- The greater degree of "service orientation" in the U.S. economy in contrast to Europe is an important causal factor.

- For example, it can be seen from Exhibit IV-I that it is estimated that in Europe, 51% of the working population are employed in service jobs of one kind or another. In contrast the estimate for the U.S. is 61%.

- The more highly developed acceptance of technology products in general and computer technology in particular in the U.S. is also an important factor.

- There is, however, an observed tendency for the advanced western economies to become more and more service oriented.

- Given this trend, the medium term forecast for information services industry growth is extremely positive and this is reflected in the market forecasts included in this report.

- Information services vendors should be aware of the potential impact on their business from general economic recession. As the same time it should be pointed out that, increasingly, financial pressures are leading organisations to counter this through the use of information services.

- Information systems are becoming more and more strategically important to an organisations' efficiency and competitive position.

- INPUT concludes that on balance just as many opportunities for information services will be created as destroyed by general economic problems.

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B. THE CHANGING COMPETITION

- As the information industry continues its rapid development, more and more new products and services become available and more and more new vendors emerge to market them.

- Although a continuous "shake-out" of weak and nonviable companies occurs the net effect is the emergence of a more and more fragmented and complex industry.

- This market is now becoming characterised by a structure formed of multiple layers of vendors adding value to various components and systems. These vendors all perform a role in the multitude of distribution channels that are being established.

- These channels are arising partly through market pull, the demand for more and more diverse and specialised systems and services, and partly by supply thrust, the availability of new products delivered by technological advance.

- This more complex market environment and the rapid development of the information services business is leading to the entry of new competitors into the market.

- A business sector growing at around 20% per annum in real terms presents an attractive target for investment within an economy only growing at 1% or 2% per annum.

- This is particularly the case where the entry business to the industry is not difficult to overcome.

- Information publishing organisations have found few problems in establishing a considerable presence in the processing services market, for example:

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- Reuters.

- Pergamon.

- Electronics companies, particularly in respect of their telecommunications interests, are taking an increasing interest in this market.

- THORNEMI is an example of a company that has, primarily through acquisitions, built a significant presence in the information services business. THOMSON in France is another example.

- STC's takeover of ICL and their interest in information services, particularly VANs, is of note.

- Other hardware manufacturers, notably IBM, are increasing their involvement in this rapidly developing market. Software products and the integrated systems sectors are those most affected.

- The PTTs and cash rich organisations looking for business opportunities are further examples of potential new competitors.

- One of the major results of the arrival of these new competitors is, naturally, increasing levels of competition. It is becoming more and more critical to build strong and viable businesses and to achieve clear differentiation from other vendors in the marketplace.

- A strategic trend that has resulted from this increased level of competitive activity is increasing interest in mergers, acquisitions or some form of joint agreements.

- Either for defensive or offensive purposes vendors are seeking appropriate commercial arrangements that will help to ensure a viable position in the market.

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- Fundamentally these maneuvers are aimed at forming groups which have:

  - A strong technical base, particularly in people, since this is the key-stone of high quality information services.

  - A sound financial position in order to meet the higher levels of research and development spending needed to maintain a leading-edge position.

  - Effective marketing skills that ensure clear market positioning and identity for the vendors' products and services within an increasingly crowded marketplace.

- INPUT questioned information services vendors on whether they were actively seeking acquisitions, mergers or partnerships. The distribution of responses is shown in the following table.

	Yes	Possible	No
Acquisitions	59%	23%	18%
Mergers	44%	16%	40%
Partnerships	62%	24%	14%

- The essential theme seems to be that most organisations interviewed do not consider that they have a viable future without some kind of arrangement with other vendors.

- We do not need to just study vendor attitudes on this subject--a high level of activity can be observed in the market. For example:

  - THORN-EMI Information Technology's most recent purchase of FCS.

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- ADP and CENTRE-FILE'S joint activity in the financial sector.

- GSI's recent acquisition in West Germany.

● Exhibit IV-2 provides some examples of typical vendor comments. There is, however, a negative side to this issue and some indication of this is given in the vendor comments included in Exhibit IV-3.

● The corollary of acquisitions is of course divestment and there is evidence that large businesses with information services subsidiaries are reassessing their long-term strategy.

● The most notable examples of this to date have been the sale of Unilever's UCSL to EDS and Barclay's withdrawal from BARIC.

● This latter move is tied in with BARIC's divestment of its batch-processing bureau activity to CMG and the focussing of its activities on value-added network services as ICL Network Services.

● Geographic expansion is another factor that alters the competitive environment within individual country markets largely dominated by native organisations.

● Europe has always been a key target market for U.S.-based companies, a number of whom (e.g., GEISCO and ADP, in addition of course to the major hardware manufacturers) have established a significant presence in most European country markets.

● The large French information services companies have also established significant operations in other country markets, notably Cap Gemini Sogeti, CISI and GSI.

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EXHIBIT IV-2

VENDOR COMMENTS ON THE NEED FOR
ACQUISITIONS, MERGERS AND PARTNERSHIPS

- We see the need for mergers because it is increasingly important to bring together a number of different strengths - one cannot make it on one's own.

- We see the possibility of mergers as a strategy for developing the business, but they must have focus.

- We see services companies seeking industrial partners, particularly in the CAD/CAM and CIM areas.

- Arrangements are needed as there is not enough money for investment in software products.

- Acquisition is one of our strategies for expanding our business.

- We have a policy of acquiring companies in our key sectors

- We try to arrange partnerships to acquire competence.

- We are very interested in partnerships. It is not easy, but it does get you into new areas of business.

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EXHIBIT IV-3

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NEGATIVE VENDOR COMMENTS ON
ACQUISITIONS, MERGERS AND PARTNERSHIPS

- Mergers are not necessarily the answer, history shows this.

- Sometimes it is just a fashion.

- Problems of compatibility can be overlooked and these are very serious.

- It can be a quick way to grow, but there are dangers particularly from the departure of key management and technical staff.

- Service to medium-sized customers can be more flexible from smaller vendors; high performance computer services is not a question of company size.

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- Of the vendors surveyed who mentioned geographic expansion, some 65% were actively implementing such a policy and a further 13% were considering it. Not all vendors responded on this issue, but nevertheless these statistics indicate high interest in this area.

- Problems mentioned by vendors in establishing foreign subsidiaries include:

    - Obtaining the right people.

    - Difficulties in opening operations from scratch.

    - The level of investment required.

- In summary INPUT concludes that information services vendors must be alert to the changing and increasing nature of competition within its served markets.

- The high level of interest in mergers, acquisitions and joint agreements, as well as geographic expansion, is strong evidence that companies are paying much attention to strategies that strengthen their position in the market in the medium and long term.

C.   TELECOMMUNICATIONS ENVIRONMENT

- The telecommunications environment is becoming more and more important to information services companies as the convergence of computer processing and communications continues.

- The deregulation of the U.S. telecommunications market and the liberalisation of British Telecom in the U.K. have been significant events during 1984.

- These events are leading to increased competition in the general information technology market, as remarked upon in Section B above. However, the application of new technology, for example ISDN, videotex services, cable and satellite transmission etc. will increase the opportunities for marketing not just processing services but new software products and professional services.

- The European communications environment has for many years been be-devilled by restrictive practices and bureaucratic PTT control, each individual authority jealously guarding its own rules and standards.

- This has led to relatively poor telecommunications infrastructure and frag-mented supporting industries. This has been particularly the case in Italy and steps are now being taken to redress this situation.

- This is creating opportunities for information technology companies, for example IBM has formed a joint venture with the Italian state-owned STET (Societa Finanziaria Telefonica) which manufactures communications equip-ment.

- IBM's moves to form joint arrangements with the French PTT and British Telecom (the planned JOVE VAN) have, however, both come to nothing.

- In West Germany IBM continues with its implementation of Bildschitmtext (BTX) for the Bundespost.

- The threat to European communications equipment manufacturers from U.S. and Japanese companies is immense. Many more joint ventures and mutual agreements can be anticipated as the European vendors attempt to stave off worldwide competition.

- The French information services vendors were in general reasonably happy with the services supplied by the PTT, particularly as much government support has been put behind the French videotex service TELETEL and the development of MINITEL.

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- Typical vendor comments were:

  - "The PTT in France will help to develop information technology".

  - "The French PTT is now more positive than negative".

  - "The promotion of MINITEL and videotex is developing our business—we get a lot of help from the PTT".

- However, some vendors did point to potential problems in the telecommunications area. Two such vendors reported:

  - "We are concerned about competition from the French PTT in our business".

  - "To overcome international communications problems we will have to do more local processing in some countries".

- The Italian information market has been the most impeded by poor telecommunications infrastructure.

- Current developments are likely to play an important part in developing the Italian market, particularly for processing services. These are:

  - ITAPAC, a public packet-switched network likely to be available during the first half of 1985.

  - VIDEOTEL, a videotex system with anticipated availability at the end of 1984.

- In the U.K. the telecommunications environment is currently in a stage of change due to the privatisation of British Telecom (BT) and the opening up of

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very limited competition from Mercury, now a wholly-owned subsidiary of Cable and Wireless.

- Many U.K. vendors commented favorably on the improvements in services and performance of BT over the last couple of years.

- Criticism was made, however, of the relatively high transmission tariffs operative in the U.K., particularly for the Packet Switch Stream service.

- One vendor commented, "More liberalisation is needed to bring the costs down--long-distance charges are one-third the price in the U.S. compared to the U.K.".

- However, the new KiloStream service, in contrast, was singled out for praise, one vendor commenting that it was "very good value for money".

- The West German Bundespost has managed to achieve a poor reputation as a result of its bureaucratic and restrictive attitude to its public.

- Limitations on transmission speeds and the attachment of nonstandard equipment have been cited as significant blocks on the development of processing services.

- Datex-P has been slow in its implementation and this has hampered the growth rate of communications-oriented data processing. Vendors generally considered that this service had many problems and was currently overloaded.

- However, one vendor commented philosophically, "Although there are many problems all competitors are confronted with the same situation".

- One general area of interest throughout Western Europe is that of Transborder Dataflow.

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- The issues in respect of personal data protection and privacy have been addressed by the agreement entitled "The Guidelines Covering the Protection of Privacy and Transborder Flows of Personal Data" adopted by the council of the OECD.

- This agreement and the Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data, adopted by the Council of Europe, have, together with corresponding national legislation, largely overcome the problems of data privacy in respect of transborder data flows.

- It is generally considered by vendors that the remaining issues of transborder data flows are practical problems that can be overcome through careful network planning and experience in dealing with the respective PTTs.

- In any event the advent of satellite communications, in effectively making national boundaries meaningless in a communications sense, will throw down a fresh challenge to the regulatory authorities.

- One of the biggest opportunities being presented to processing services companies by the convergence of data processing and communications is that of value-added network services (VANs).

- Although the term VANs is a much abused term, it does focus attention on some very real opportunities.

- In the narrowest sense a VAN is any transmission network in which some processing of data is carried out.

- As communications and data processing continue to converge, more and more opportunities will arise for the development of new services.

- Increasing inter- and intraorganisation communication, particularly on an international level, will drive the demand for these new services which are likely to mix voice and data.

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- Currently much confusion exists in this marketplace. New ISDN services have to be widely implemented, protocol choices made (i.e., OSI or SNA), before the full opportunities can be realised.

- High capital investment and commitment to this business area will be needed to succeed.

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V INFORMATION SERVICES MARKET ISSUES

V   INFORMATION SERVICES MARKET ISSUES

- This chapter provides a review and analysis of general issues of importance facing vendors and users in the information services market.

A.   ANALYSIS OF VENDOR ISSUES

1.   INDUSTRY-SPECIFIC MARKETING

- At the present time a majority of the vendors interviewed (67%) showed no bias between cross-industry and industry-specific applications of their products and services. The distribution is shown in Exhibit V-1.

  - Towards cross-industry applications only 12% showed a moderate bias (between 50 and 70%) and no vendors showed a strong bias.

  - In contrast 8% showed a moderate bias and 12% a strong bias towards industry-specific applications.

- The distribution of vendors' views with regard to their expected bias in two years time is also shown in Exhibit V-1.

- This distribution shows a clear trend towards increased emphasis on industry-specific systems.

EXHIBIT V-1

DISTRIBUTION OF RESPONDENTS' PRODUCT
DEVELOPMENT BIAS

Cross-Industry

Strong Bias
(i.e., 70%)   0%
              0%

Moderate   12%
              8%

No Bias   67%
              33%

Moderate   8%
              42%

Strong Bias
(i.e., 70%)   12%
              17%

0   20   40   60   80   100%
Percent of Respondents

Industry-Specific

☐ Now
▨ In Two Years' Time

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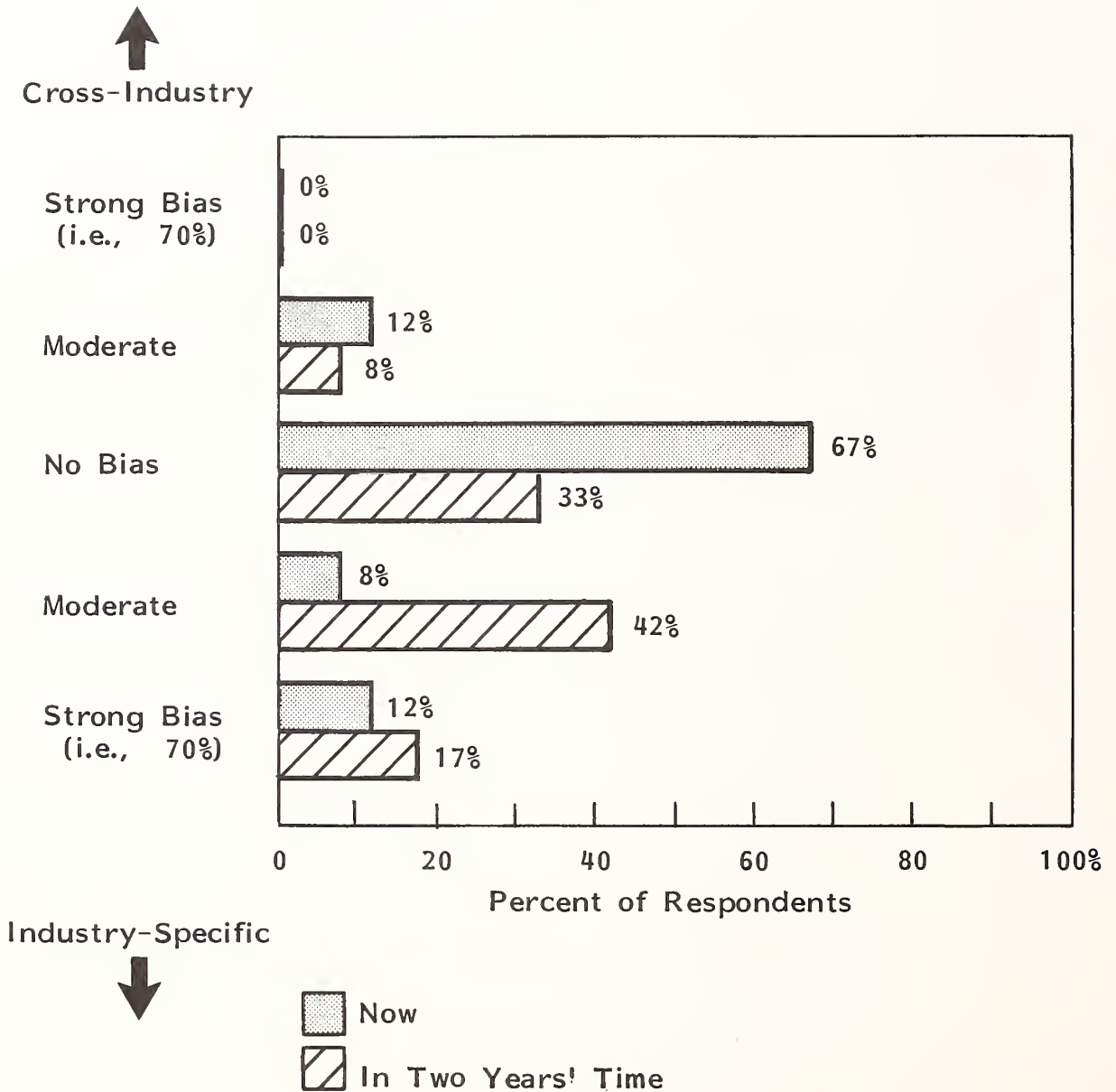
- Over half the vendors interviewed (59%) expect to place at least moderate emphasis on industry-specific products and services within this timescale.

2.   STAFF SHORTAGES

- While many information services vendors are alert to the possibility that staff shortages could seriously impact their business growth, it does not yet seem to be a critical problem in the Western European market. It has, however, already become a serious problem in the U.S. market.

- Exhibit V-2 shows the distribution of vendors' perception of the impact on their business of staff shortages in the major categories of staff employed by information services vendors.

- The categories of software professionals and technical support/engineers stand out as being most critical.

- But even in these two areas only 32% of the vendors considered the staff shortage to be of high impact. Over one third of all companies reported no impact on their business in each case. The French vendors were most affected by shortage in these two areas.

- Sales executives, an area notorious for high staff turnover, was the third highest rated for high impact, at 20%.

- As in most areas it is shortage of good people which is the problem not shortage of applicants. As one vendor commented, it is not difficult to find salespeople as such; it is good salespeople who are hard to recruit.

- INPUT anticipates that the problems of staffing will become more severe in the next few years and could act as an inhibitor on the fast growth in the professional services area.

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EXHIBIT V-2

IMPACT OF STAFF SHORTAGES

Percent of Respondents

High Impact Low Impact

Medium Impact No Impact

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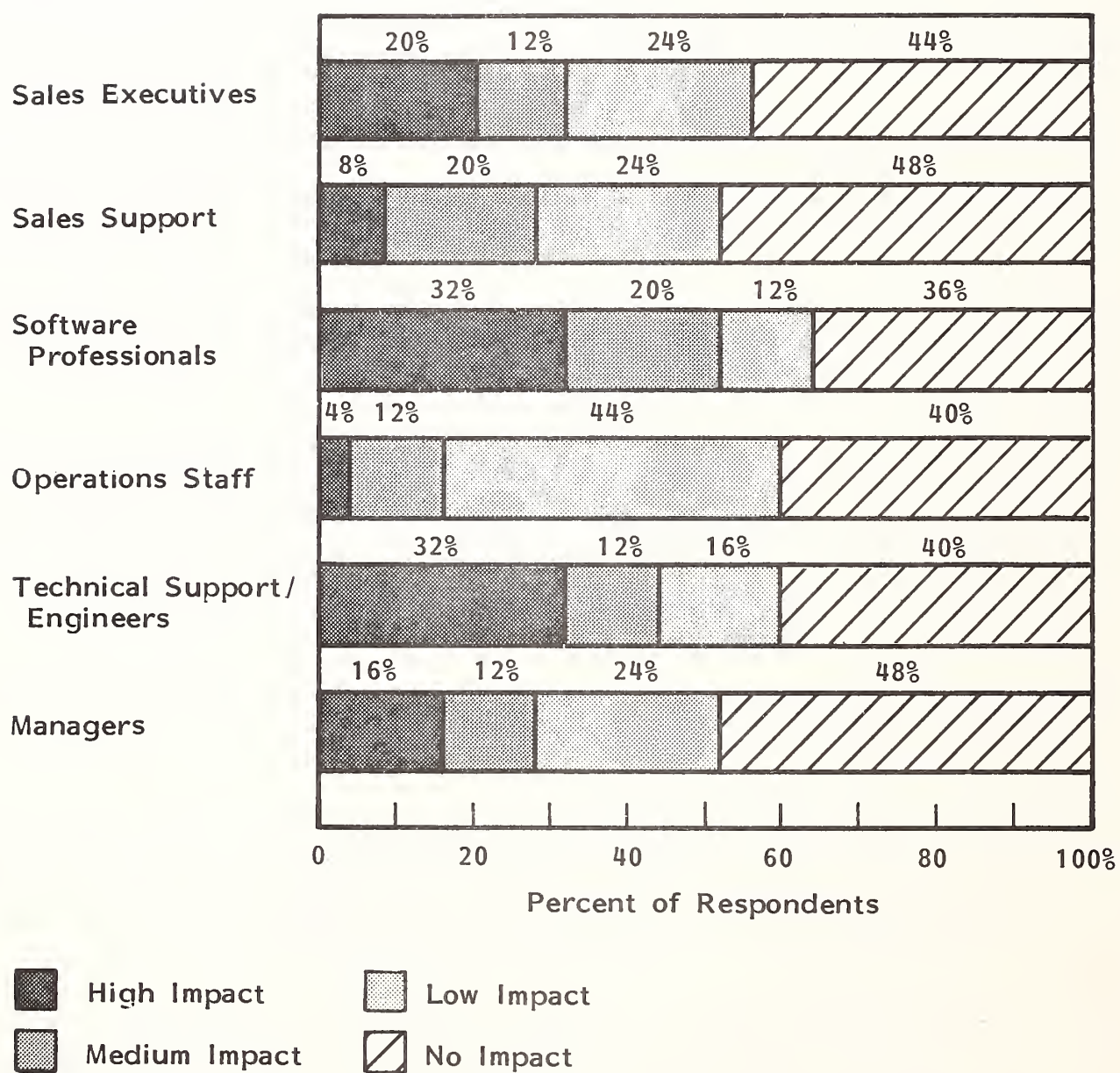
- Two vendor comments that support this view were:

  - "We are finding that staff shortages are increasingly a problem".

  - "There are not enough graduates with computer science degrees".

- Particular areas of staff shortages identified by vendors include:

  - Personnel experienced in communications.

  - Artificial intelligence.

  - IBM system programmers.

  - Capacity planning.

- Most major professional services vendors, particularly the U.K.-based companies, are currently coping with rapid expansion by recruiting large numbers of graduates and utilising their own highly developed internal training procedures.

- However, major French professional services vendors, by virtue of their size, are finding that shortages of key professional staff are beginning to impact their business.

- It is interesting to note that in Cap Gemini Sogeti's 1983 Annual Report they quote the statistic that 18% of all 1983 employment advertisements in France were job offers for DP professionals.

- It can be anticipated that information services companies will be increasing their efforts to employ advanced software engineering approaches in order to achieve increased productivity and growth.

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- Already the largest vendors are moving positively in this direction. Cap Gemini Sogeti is placing emphasis on their MultiPro programmers work-stations, LOGICA claim much success with their "system kernels" approach.

3. FUTURE MARKET OPPORTUNITIES

- Future market opportunities for information services companies are being created by new technological developments in both hardware and software.

- In the convergence of communications and computer processing the emergence of VANs is an important opportunity as already discussed in Section C of Chapter IV above.

- The development of videotex services is seen by most vendors as of high importance. Within France and the U.K. an established videotex environment already exists and many videotex-based services are in operation.

- Within the German and Italian markets the development of Bildschitmtext (BTX) and VIDEOTEL, respectively, will act as a drive to the development of services. A typical German vendor's comment was, "We intend to participate in the BTX business".

- A minority of vendors expressed scepticism over the opportunities in the videotex area, one U.K. vendor commenting, "It is too late in the day for videotex".

- INPUT considers that increasing acceptance of personal computers in business, and in the home environment as well, is leading to some loss of interest in the development of videotex systems.

- The development of relatively low-cost and easy-to-use personal computers has undermined some of the original strategic concepts upon which the videotex concept was based.

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- As a result there is likely to be a merging of the personal computer and videotex concepts. Already products are available on the market with features of both types of system.

- INPUT concludes that videotex does offer market opportunities to information services companies. As a particular delivery mechanism it offers advantages in areas of the market where operator skills are limited. Services vendors must be careful to ensure that the most appropriate technology is applied.

- Another area of potential opportunity is that of office systems or office automation.

- While a minority of vendors (25% by those who commented on this issue) expressed a negative view, the majority (75%) were positive and were either already offering some office automation services or were planning to.

- However, there were reservations about the immediate potential in this area even among the positively inclined views. Some vendors made comments like, "It (office automation) has not really taken off," and "It will be important but not yet".

- As well as the fairly widespread offering of electronic mail services on networks, which can perhaps be loosely included within a definition of office automation, vendors mentioned the following areas:

  - Providing consultancy for the installation of office automation.

  - Providing gateways for office systems through to other services.

  - Implementation and hosting services to support faster adoption of new systems.

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- Providing integrated systems for departmental applications.

- Providing office automation in engineering environments.

- Systems for controlling personal computers within an office automation environment.

- Supporting services for PABX systems.

- French and U.K. vendors were generally the most positive in their views towards the development of office automation services.

- The German vendors interviewed seemed most cautious, one commenting, "The office of the future is overestimated in terms of making an independent business".

- Vendor assessments of a number of other areas that INPUT had identified as potential future market opportunities are shown graphically in Exhibit V-3.

- Areas that were clearly of strongest interest were:

- Personal computers.

- On-line data bases.

- Software development productivity services.

- Multiple delivery modes for software.

- Fourth-generation languages.

- None of the areas identified in Exhibit V-3 was without some level of interest on the part of vendors. It is interesting to note that both "expert systems"

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EXHIBIT V-3

VENDOR ASSESSMENT OF NEW OPPORTUNITY AREAS

Opportunity Area	High Interest	Medium Interest	Low Interest	No Interest
On-Line Database	50%	23%	13%	14%
Multiple Delivery Modes for Software	45%	18%	18%	20%
Fourth-Generation Languages	43%	29%	20%	8%
Support of Professionals	29%	32%	25%	14%
Decision Support Systems	29%	43%	20%	8%
Expert Systems	21%	23%	36%	20%
Education/Training Software	28%	28%	28%	16%
Software Development Productivity Services	45%	27%	20%	8%
Personal Computers	48%	29%	12%	11%
New Languages, Operating Systems	36%	25%	21%	18%

Percent of Respondents

High Interest   Low Interest
Medium Interest   No Interest

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and "decision support systems" rated a fairly low level of interest in comparison to the other topics.

B.   ANALYSIS OF USER ISSUES

- A questionnaire was mailed to users as part of the MAPS/E 1984 programme in order to gauge levels of use of EDP and to aid in highlighting changes and trends.

- The user questionnaire is included as Appendix D.

- The major areas covered are:

    - Application use and trends.

    - User budgets.

    - The use of outside computer services and software.

    - Levels of user satisfaction.

    - Communications issues.

I.   APPLICATION USE AND TRENDS

- One of the most important areas of interest for IS vendors is the user prioritisation of his EDP objectives. These reveal possible buying decisions and thus can point to sales opportunities.

- Exhibit V-4 shows the primary objectives of data processing management for 1984 and for the next two years.

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EXHIBIT V-4

DATA PROCESSING MANAGEMENT PLANS –
RELATIVE PRIORITY OF OBJECTIVES

	1984	1985	1986
Install On-Line Applications	16%	14%	13%
Develop Information Centre	8%	9%	9%
Convert Applications	8%	7%	6%
Design/Install DDP Network	7%	7%	6%
Meet Development/ Conversion Schedules	7%	6%	6%
Design/Install DBMS	7%	6%	4%
Develop Long Range DP Plan	6%	5%	5%
Install Personal Computers	5%	5%	5%
Improve DP Personnel Productivity	5%	4%	4%
Develop New Batch Applications	4%	4%	5%
Use Fourth-Generation Languages	4%	5%	5%
Install Office Automation	4%	6%	7%
Install New Peripherals	4%	4%	5%
Install New Mainframe	3%	3%	5%
Install Minicomputers	2%	3%	3%
Other	10%	12%	12%

Percent of Mentions Weighted According to Priorities

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- The relative importance of each objective has been derived by weighting each priority mention on the basis of first priority counts five, second counts four, down to one for fifth priority or lower.

- The installation of on-line applications is, as perhaps might be expected, the overiding priority of data processing management over the three-year period.

- The development of the information centre and the conversion of applications were the next most highly rated tasks. While the information centre becomes more important, conversion declines.

- DDP Networks, DBMS and "meeting development and conversion schedules" are also important priorities for DP management.

- It is interesting to note the relatively lower priority given to such items as improving DP productivity, using fourth-generation languages and installing office automation. However, emphasis appears to be increasing over this period in the latter two, particularly office automation.

- Exhibit V-5 provides a ranking of the problems perceived by DP managers as most significant. A similar weighting to that used for rating DP plans was applied.

- Excessive applications backlog was the most significant problem reported by the DP managers in the sample. This ranked equal with personnel recruitment as the first priority.

- Excessive applications development time only ranks fourth as a first priority but equal first with its corollary, excessive applications backlog.

- A comparison of the development of new applications in 1984, analysed by main category, with that of existing applications is shown in Exhibit V-6.

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EXHIBIT V-5

RANKING OF MOST SIGNIFICANT PROBLEMS FOR DATA PROCESSING MANAGEMENT

	PERCENT OF MENTIONS IN EACH PRIORITY					
	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	All Priorities
Excessive Applications Backlog	16%	22%	14%	8%	–	12%
Personnel Recruiting	16	5	8	8	14	9
Lack of General Management Understanding	14	2	–	3	12	8
Excessive Applications Development Time	12	22	20	8	6	13
Personnel Training	11	6	2	10	12	7
Lack of User Involvement in Systems Development	9	7	13	3	3	9
Need for Improvements in Operations	9	2	8	8	12	8
Need for Improved Data Communications	5	17	8	3	14	9
Need for Better Planning and Control	4	11	13	8	9	9
Inadequate DP Budgets	2	2	6	19	9	7
Inadequate Systems Software	2	2	6	17	9	7
Unsatisfactory Hardware Maintenance	–	2	2	5	–	2
Total	100%	100%	100%	100%	100%	100%

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EXHIBIT V-6

COMPARISON OF RESPONDENTS' EXISTING APPLICATION
AREAS WITH PLANNED NEW DEVELOPMENTS

	EXISTING APPLICATION	NEW DEVELOPMENT
Industrial/Manufacturing Control	5%	10%
Engineering/Design/Research and Development	4%	5%
Order Entry/Billing/Purchasing	15%	12%
Production/Inventory Control	10%	18%
Distribution/Transportation	10%	7%
Marketing Sales	12%	9%
Personnel/Payroll	17%	11%
Accounting/Finance	19%	17%
Other	8%	11%

0   5   10   15   0   5   10   15   20%

Percent of Mentions Weighted According to Priorities

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- Accounting and finance is a dominant area at 17% of all mentions for new development.

- Production and inventory control is also important, increasing its representation from 10% for existing applications to 18% for those currently under development.

- Personnel and payroll and order entry are two broad areas of application that show a decline in the number of mentions between existing and new development. This is also the case for marketing and sales.

- Significantly industrial and manufacturing control doubles from 5% to 10%.

● It is also worth noting the areas of information centre applications development and decision support systems within the "other" category.

● The modes of operation for these application areas, whether being run on a central site or remotely, are shown in Exhibit V-7.

- Overall, 83% of new development is being undertaken for use on a central site machine, and only 17% of mentions are for remote sites.

- The most frequently centralised application area (excluding the "other" category) is accounting and finance at 97% of mentions.

- This is followed by personnel and payroll, engineering design/R&D, distribution and transport and marketing/sales.

- The most frequently decentralised application areas are, in order;

  . Production/inventory control.

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EXHIBIT V-7

PRIMARY MODES OF OPERATION FOR NEW DEVELOPMENTS – CENTRAL VERSUS REMOTE SITES

	Central	Remote
Industrial/Manufacturing Control	71%	29%
Engineering/Design/Research & Development	86%	14%
Order Entry/Billing/Purchasing	79%	21%
Production/Inventory Control	65%	35%
Distribution/Transportation	82%	18%
Marketing Sales	82%	18%
Personnel/Payroll	96%	4%
Accounting/Finance	97%	3%
Other	86%	14%
Overall	83%	17%

Percent of Respondent Mentions

For Central Operations

For Remote Site Operations

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- Industrial/manufacturing control.

- Order entry etc.

  - In no area does the distributed approach predominate over the central site development approach.

- Exhibit V-8 represents, graphically, user respondents' preferences for the development of new applications, the choice between developing in-house or purchasing from outside suppliers.

- Personnel/payroll and accounting/finance stand out as areas where users are most willing to seek outside solutions. In each case the balance in favour of outside purchase was 61% to 39%.

- These two areas present themselves as key targets for outside services because of their universality, their importance and criticality to the running of an organisation and the fact that they are subject to changing government regulation.

- The other area of high potential for outside services is industrial and manufacturing control, which rates higher than engineering design and research and development. This is a key area for integrated systems.

2. BUDGET

- Fifty-three out of the total sample of sixty-four users provided full details of their data processing budgets. These included a cross section of both large and small accounts.

- The total of these data processing budgets for the year 1984 amounted to $252 million, an average of $4.75 million per user organisation.

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EXHIBIT V-8

SOURCES OF NEW APPLICATION DEVELOPMENTS –
IN-HOUSE VERSUS OUTSIDE PURCHASE

Application	In-House Development	Outside Purchase
Industrial/Manufacturing Control	62%	38%
Engineering/Design Research & Development	71%	29%
Order Entry/Billing/Purchasing	95%	5%
Production/Inventory Control	75%	25%
Distribution/Transportation	83%	17%
Marketing/Sales	95%	5%
Personnel/Payroll	39%	61%
Accounting/Finance	39%	61%
Other	67%	33%
Overall	67%	33%

Percent of Respondent Mentions

In-House Development

Outside Purchase

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- Exhibit V-9 shows the analysis of the 1984 budgets by major categories of expenditure. Allocations or expenditures for accommodation of data processing activities were excluded.

- The split between expenditure on central site as opposed to remote or dispersed computing activity is also shown as is the anticipated change that users will make in their expenditure between 1984 and 1985.

- Personnel is by far the largest component of expenditure at 40%. Expenditure on mainframes and their associated peripherals were also substantial proportions.

- It is interesting that personal computers and office automation both ranked very lowly (at 1% or under) in most budgets during 1984.

- This situation is set to change with these two categories representing the highest anticipated growth in respect of the 1985 budget. Personal computers of 28% and office automation at 58%.

- There were distinct country market differences in the growth for these two categories amongst the user respondents in this survey.

- The U.K. and Italian respondents predicted far higher expenditures on personal computers than were the Franch and West German respondents.

- In office automation high growth was predicted by all respondents with the exception of the Italian group.

- Processing services was the only sector in which a decline in expenditure was predicted for 1985.

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EXHIBIT V-9

RESPONDENTS' DATA PROCESSING BUDGET CATEGORIES

BUDGET CATEGORY	1984 BUDGET		PERCENT SPLIT BETWEEN SITES		ANTI-CIPATED CHANGE 1984-1985
	$ Millions	(Rounded) (Percent)	Central	Remote	
Personnel	$101.0	40%	96%	4%	+8%
Mainframes	38.3	15	98	2	+15
Peripherals	30.3	12	96	4	+17
Minicomputers	7.7	3	60	40	+19
Personal Computers	2.1	1	73	27	+28
Terminals	18.2	7	43	57	+22
Office Automation	1.7	1	60	40	+58
Communications	17.6	7	66	34	+18
Software	11.4	5	97	3	+11
Maintenance	10.6	4	90	10	+9
Processing Services	5.5	2	99	1	-2
Supplies and Other Including Professional Services	7.6	3	95	5	+5
Total	$252.0	100%	89%	11%	+12%

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- Average budget growth anticipated was 12%, and clearly substantial increases in hardware expenditure are planned, particularly on terminals and communications.

- The anticipated increase in expenditure for software was only 11%.

3. USER SATISFACTION

- Exhibit V-10 shows the results of the survey of user satisfaction levels with information services.

- Users were asked to rate their satisfaction level as high, medium or low. For weighting purposes, high was allocated five, medium three, and low one.

- Highest ratings were obtained, in the following order, by:

    - Batch processing services.

    - Hardware maintenance.

    - Systems software.

- The lowest ratings were achieved for:

    - Facilities management.

    - Integrated systems.

    - Consultancy.

- The conclusion can be drawn that the more standard the product or service the more likely it is that the user will be satisfied.

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EXHIBIT V-10

USERS' SATISFACTION WITH INFORMATION SERVICES

TYPE OF SERVICE	NUMBER OF MENTIONS	SERVICE RATING
RCS-Interactive	15	3.7
RCS-Remote Batch	12	3.5
Batch Services	17	4.1
FM	11	3.0
Total Processing Services	55	3.6
Integrated Systems	13	3.2
Hardware Maintenance	38	4.0
Systems Software	48	3.8
Applications Software	47	3.3
Total Software Products	95	3.5
Consultancy	27	3.2
Custom Software	18	3.3
Education/Training	36	3.3
Total Professional Services	81	3.3

1   2   3   4   5

Low Satisfaction   High Satisfaction

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- The more nonstandard or technically demanding the product or service the more difficult it is to achieve user satisfaction.

- In any event the spread of ratings between 3.0 and 4.1 is relatively narrow, no sector being marked overall below medium satisfaction.

- The average rating for all services was 3.5.

4. COMMUNICATIONS ISSUES

- Exhibit V-11 provides an overall picture of the use of communications services by the respondent user group.

- This exhibit shows current and planned use for each communication service.

- In the key area of videotex it shows quite high (but possibly limited) use of public videotex services. However, despite high planned use of videotex an even larger number have no plans.

- A similar situation exists with regard to private videotex services although a rapid increase in use can be anticipated in the period up to 1986.

- Steady growth can be anticipated for electronic mail services and the use of packet-switched networks.

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EXHIBIT V-11

PRESENT AND FUTURE USAGE OF TELECOMMUNICATIONS

	NUMBER OF MENTIONS OF USE				
	NOW	1984-1986	1987-1989	NO PLANS	DO NOT KNOW
Dial-Up	37	6	3	1	1
Leased Line	38	6	-	4	1
Packet-Switched Network	7	11	5	9	7
Telex	37	5	2	4	2
Public Videotex	11	10	5	15	2
Private Videotex	3	9	4	16	2
Electronic Mail	9	16	9	6	3
Telecopier/Facsimile	32	6	2	6	2

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VI PROCESSING SERVICES

VI PROCESSING SERVICES

A. INTRODUCTION

- Processing services has historically been the largest sector of the information services business, but during the forecast period to 1989 covered in this report it will lose that position.

- Radical developments in the availability of information processing products and consequent changes in buyer behaviour are leading to a relative decline in traditional processing services markets.

- At the same time these developments are accelerating the demand for software products and professional services which will become by 1989 the largest and second largest sectors respectively.

- Although traditional processing services markets, most notably batch, are declining in importance there are certain subsectors that represent rapidly growing opportunities for processing services vendors.

- On-line database services and value-added networks (VANs) are of considerable importance.

- These and other business development opportunities are elaborated upon in Section D.2 below.

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B.   MARKET DEVELOPMENT, 1984-1989

- The processing services sector achieved an overall market size of $2.5 billion in 1983 and is expected to reach $2.7 billion in 1984.

- Growth at just over 11% per annum will be maintained in the period up to 1986 and is expected to increase to around 13% per annum between 1986 and 1989.

- Exhibits VI-1 through VI-5 provide summary tables of the forecast growth for processing services in the Western European market as a whole and the four individual country markets.

- Each table shows a medium term forecast for 1986 and a longer term forecast through to 1989, in each case the individual country markets are analysed by their component subsectors.

- France is the largest individual country market representing some 37% of the total, second largest is West Germany at 26% followed by the U.K., 22%, and Italy, 15%.

- The most striking growth market for processing services is the data base enquiry or on-line database market which is forecast to quintuple to $1.3 billion by 1989 averaging growth of nearly 30% per annum, far in excess of the sector average.

- Remote batch processing will also continue to grow largely because of the transfer towards distributed processing. This subsector will however show lower growth than that for interactive processing due to the more rapid decline of traditional remote batch processing over that of basic interactive services.

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EXHIBIT VI-1

PROCESSING SERVICES MARKET FORECAST, 1984-1989
- WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Interactive	$ 541	$ 599	15%	$ 820	18%	$1,333
Remote Batch	379	398	8	473	11	640
Database Inquiry	276	341	28	576	27	1,193
USHS	78	85	14	115	17	186
RCS Subtotal	$1,274	$1,423	16%	$1,984	19%	$3,352
Batch	1,114	1,123	2	1,181	-	1,191
Facilities Management	122	126	7	149	10	199
Total	$2,510	$2,672	10%	$3,314	13%	$4,742

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EXHIBIT VI-2

PROCESSING SERVICES MARKET FORECAST, 1984-1989
- FRANCE

SUBSECTOR	MARKET FORECAST (French Francs (FF) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Interactive	1,773FF	2,180FF	23%	3,290FF	21%	5,830FF
Remote Batch	1,070	1,200	12	1,500	10	1,990
Database Inquiry	655	837	30	1,435	28	3,042
USHS	264	315	20	456	20	785
RCS Subtotal	3,762FF	4,532FF	21%	6,681FF	20%	11,647FF
Batch	3,580	3,760	5	4,150	3	4,535
Facilities Management	650	715	10	870	12	1,220
Total	7,992FF	9,007FF	13%	11,701FF	14%	17,402FF

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EXHIBIT VI-3

PROCESSING SERVICES MARKET FORECAST, 1984-1989
- ITALY

SUBSECTOR	MARKET FORECAST (Lira (£) Billions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Interactive	£ 86	£ 98	27%	£ 175	32%	£ 407
Remote Batch	155	181	20	270	22	488
Database Inquiry	36	46	33	84	34	204
USHS	18	20	17	29	30	64
RCS Subtotal	£295	£ 345	24%	£ 558	28%	£1,163
Batch	325	385	14	480	12	682
Facilities Management	12	13	10	16	13	23
Total	£632	£743	19%	£1,054	21%	£1,868

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EXHIBIT VI-4

PROCESSING SERVICES MARKET FORECAST, 1984-1989
- UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Interactive	£142	£156	11%	£196	15%	£302
Remote Batch	52	53	4	58	8	73
Database Inquiry	86	111	29	185	26	370
USHS	14	15	13	20	16	31
RCS Subtotal	£294	£335	16%	£459	19%	£776
Batch	122	110	-7	98	-8	77
Facilities Management	16	17	14	24	18	40
Total	£432	£462	10%	£581	15%	£893

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EXHIBIT VI-5

PROCESSING SERVICES MARKET FORECAST, 1984-1989
- WEST GERMANY

SUBSECTOR	MARKET FORECAST (Deutsche Marks (DM) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Interactive	275 DM	315 DM	15%	420 DM	16%	656 DM
Remote Batch	274	292	7	316	10	420
Database Inquiry	184	246	33	435	30	961
USHS	55	61	15	83	16	129
RCS Subtotal	788 DM	914 DM	17%	1,254 DM	20%	2,166 DM
Batch	988	1,050	4	1,112	-2	1,034
Facilities Management	54	56	5	62	8	76
Total	1,830 DM	2,020 DM	10%	2,428 DM	10%	3,276 DM

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- User site hardware services will show moderate growth as RCS vendors seek to further exploit microcomputer technology and distributed processing techniques harnessed to a central services or networking concept.

- This on-line database market is clearly a major contributor to the overall growth of processing services in this sector which is being driven to a large extent by new types of services competition—like Reuters—in the area of on-line financial information.

- Bedevilled in the past by poor profitability this market is now rapidly achieving a viable size, thus presenting good growth opportunities to services organisations.

- INPUT cautions vendors to select opportunities carefully in this market and to focus products appropriately.

- A full description of the dynamics of this market is provided in INPUT's report European On-Line Database Markets, 1984-1989, published in October 1984.

- Interactive processing is forecast to expand at around 20% per annum and will be the largest subsector by 1989, eclipsing batch processing which was previously dominant.

- Batch processing will continue to languish as a result of the overall trend towards more remote and interactive processing and the rapidly increasing use of microcomputers and distributed processing. This trend is particularly apparent in the U.K.

- Facilities management has for a long time been considered an area of specialist opportunity only. There are however signs that this situation is changing and there is some likelihood that this sector could show reasonable growth.

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- This growth is likely to result from the desire by general management to free themselves from direct responsibility for an increasingly important but increasingly complex responsibility, their information processing activity.

- Facilities management represents a potential solution to this problem. It places recognition on the importance of information processing in an organisation by putting it in the hands of professional services management and allows general management to concentrate their energies on running their own business.

C. USER ATTITUDES AND TRENDS

- The sample included 17 users who commented on their level of satisfaction with their use of processing services.

- Overall, satisfaction expressed was relatively high, processing services scoring 3.6 on the comparative chart shown as Exhibit V-10.

- Exhibit VI-6 shows the distribution of levels of satisfaction expressed for four categories of processing services used.

- It can be seen that satisfaction with batch processing was markedly higher (4.1) than for other services and facilities management was rated markedly lower (3.0).

- One area of criticism that stood out was the users' perception of remote computing services as a high cost item. Typical user comments were:

  - "Generally good, but expensive".

  - "Costly, but useful".

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EXHIBIT VI-6

USER SATISFACTION LEVELS WITH PROCESSING SERVICES

AVERAGE
RATING

		AVERAGE RATING
RCS – Interactive	33% / 67%	3.7
RCS – Remote Batch	25% / 75%	3.5
Batch	53% / 47%	4.1
Facilities Management	9% / 82% / 9%	3.0

0   20   40   60   80   100%

High Satisfaction

Medium Satisfaction

Low Satisfaction

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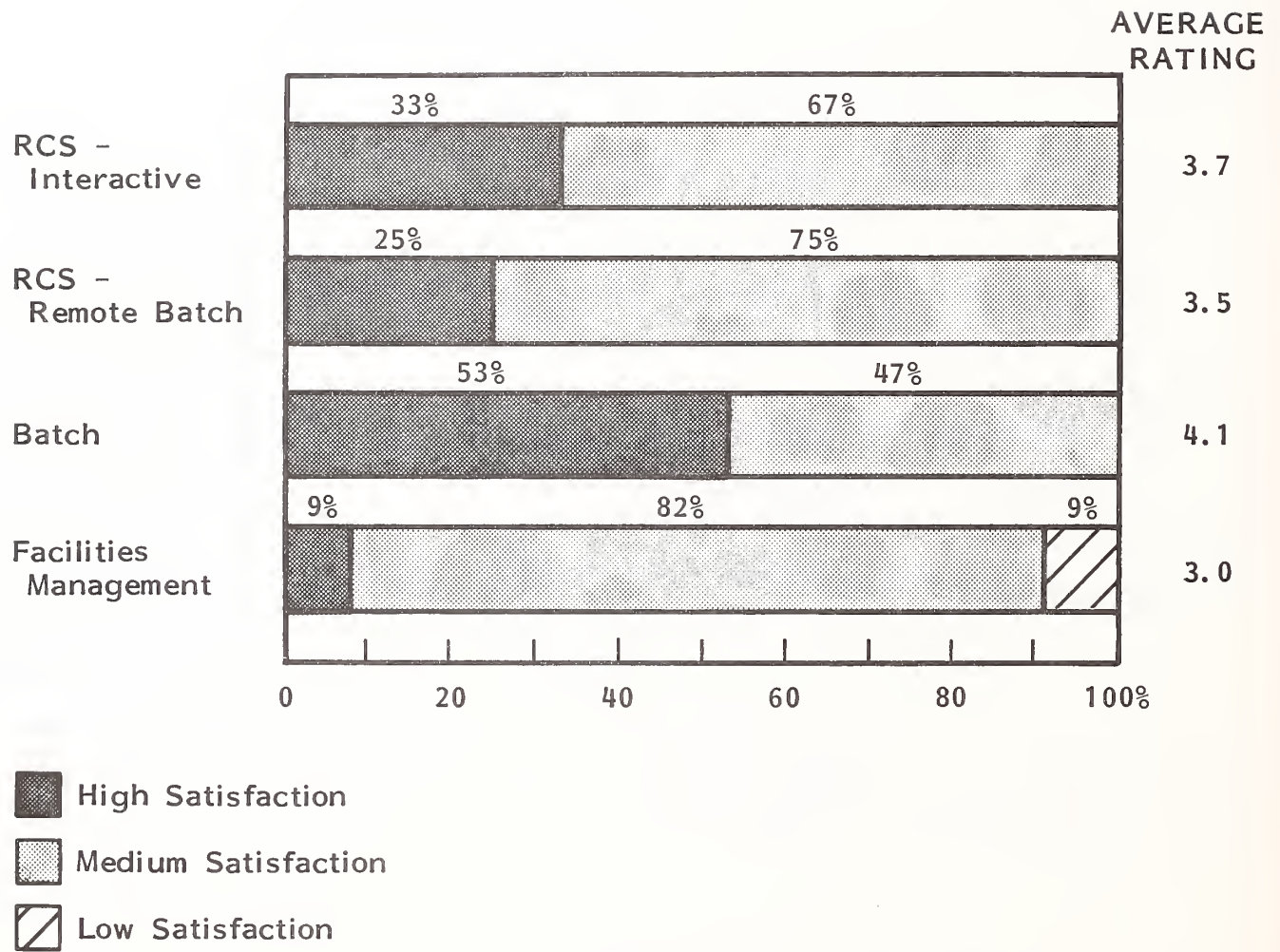
- Another aspect of user reaction concerned interest in meeting specialised needs through a processing services solution rather than just the need for handling peak demands for machine time.

- The latter still provides some business opportunities for bureau, particularly where customers are in a heavy test environment.

- Processing services vendors must recognize that the markets for their products are changing and that as traditional customer bases decline, completely new markets are opening up.

- Data processing management reflect a strong tendency towards the implementation of centrally controlled in-house solutions, in many cases implemented through distributed data processing approaches.

- Consequently they have shifted away from the service solution. However, this trend among the smaller and medium-sized organisations is in contrast to the needs of larger companies to seek services solution as the complexities and scale of their information processing requirements is beyond the capability of their own resources. The most important example of this is interactive networking requirements.

- Additionally completely new classes of users are emerging through the growth of on-line database services.

- It must not be forgotten that opportunities for processing services will continue to arise in any area in which it is either too difficult, too costly, too slow or too critical for a user to develop his own solution.

- Thus, as well as continuing support for traditional applications like payroll, the user trend is towards the need for specialised services—laser printing, COM, and of course networking.

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D.   VENDOR ISSUES

●   Thirty-seven companies out of the 56 interviewed provided processing services of some kind. Of these, 34 completed the processing services module of the vendor questionnaire.

1.   THE CHANGING MARKET

●   The vendors interviewed provided strong evidence of the rapidly changing form of the processing services business.

●   The demand for traditional RCS utility services has declined rapidly. Vendors that have not sought to adapt their product mix have suffered precipitous revenue drops--one vendor quoted a 40% per annum decline, another 22%.

●   Many processing services vendors have however made radical changes to their service offerings over the past few years, moving into growth areas and away from declining business areas.

●   Of those vendors who were prepared to comment in some detail on their revenues, eight reported increases and six declines.

●   The market is moving in the direction of fuller service offerings and towards more complex systems. These trends are of course complementary.

●   As services companies have moved to meet the demand for more complex applications so have the user's needs for additional consultancy and training.

●   The more complex applications have typically been industry specific and thus there has been a much greater awareness and exploitation of vertical market approaches.

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- Processing services companies have thus been forced to pay much closer attention to the needs of users through every stage of their data processing life cycle.

- This has meant moves into more complex software applications often provided in a number of delivery modes and backed up by consultancy and training services.

2.   BUSINESS DEVELOPMENT

   a.   <u>General</u>

- Growth in the market for processing services will be uneven across subsectors in the period to 1989 and vendors must therefore pay close attention to the areas of maximum opportunity.

- Four areas that represent opportunities for business development are singled out for particular comment in the subsectors below, these are:

   -   VANs.

   -   On-line database.

   -   Facilities management.

   -   USHS.

- The general trend towards interactive processing and distributed solutions are causing the batch processing market to decline in real terms and as a proportion of the overall processing services market, from 45% in 1983 to just over 25% by 1989.

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- Nevertheless, there is still a vast quantity of processing that is most appropriately processed in batch mode. This "hard core" will remain for the foreseeable future and remain profitable businesses for those vendors (like DATA-SOLVE) that have deliberately chosen to specialise in this subsector.

- The remote batch subsector will offer new opportunities as its composition is likely to change. Some applications will be lost to the subsector as they migrate to interactive networked systems, while new business will be created to some extent from the batch sector as a distributed approach is adopted.

- The interactive processing market is also changing radically in its composition. On the negative side the supply of traditional utility processing services has been in decline in Western Europe for several years.

- However, many vendors, for example GEISCO and IBM-INS, are offering services that are more multiuser oriented, more transaction oriented and thus more complex.

- In consequence these applications offer vendors greatly enhanced value-added potential. Not only are these full systems offerings developing the processing workload but are also leading to increased demand for consultancy, software and training, all of which represent revenue opportunities.

  b.   VANs

- A major business development opportunity is rapidly opening up through the demand for communications services. This area can most conveniently be described as value-added networks or VANs.

- VANs represent the most singular manifestation to date of the marrying together of computer data processing and communications technology.

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- The advance of information technology is opening up enormous potential for communications and data processing to be combined at increasingly more affordable prices and in increasingly more flexible and adaptable forms.

- This is being matched by a latent demand for the newly available products and services driven by increasing complexity in intra- and intercompany relationships.

- Wide area and international communication links are a vital component for the efficient operation of the increasingly complex commercial environment.

- Electronic mail services are a very basic example of this kind of service.

- Much industry interest has focussed on this area during 1984, fuelled partly by the controversial proposal for a joint British Telecom/IBM VAN dubbed "JOVE," which was abandoned following the U.K. government's refusal to grant an operating license.

- VANs represent an area of high capital investment, consequently it is the largest organisations that are most obviously active in exploiting this opportunity area.

c.   On-Line Database

- The growth in demand for on-line database products and services represents the highest growth opportunity of all the various components of the processing services sector.

- The opportunities for processing services vendors in this area have been heralded for several years but have been bedevilled by poor profitability.

- Many of the services introduced in the past have not been commercially sound and this has led to considerable skepticism.

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- However, certain services have grown spectacularly, most notably in the financial sector, which has resulted in organisations like Reuters becoming an important part of the processing services market.

- Vendors must be very careful in selecting appropriate opportunities in this area and considerable marketing commitment is considered necessary to achieve success.

- INPUT expects specialist "information companies" to emerge as the major force in this market. These vendors will be most likely to control the data-base ownership and to have specialist industry knowledge associated with it.

- Traditional RCS vendors keen to exploit this market opportunity will have to adopt a specialisation strategy or seek appropriate acquisitions or partner-ships.

d. Facilities Management

- Historically, facility management (FM) has been viewed as a specialist niche market. It has also been considered financially risky because of the possible large drop in revenues as contracts expire.

- A large company like Hoskyns has been able to develop a considerable business in this area but for most companies it has remained an area of limited interest.

- However, FM has always represented the ultimate step in a services approach to the provision of data processing capability. As such, INPUT considers that there will be increasing demand for FM services in the next few years.

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- There are two key but related factors that will lead to this increased demand:

  - Increasing complexity in information technology.

  - Increasing pressure on general management to concentrate their resources on their own business—the principle of "stick to the knitting".

- As the convergence of computers and telecommunications progresses and the plethora of available hardware and software multiplies, many organisations will become increasingly unable to cope with the harnessing of that technology to meet their corporate objectives.

- Consequently the attractiveness of FM will increase as a response to that dilemma.

- The more difficult the competitive position and the management problems of a company's prime business, the more pressure will exist to delegate responsibility and accountability for supporting activities should a service alternative exist.

- To date only a minority of vendors are becoming aware of this opportunity. Among the vendors interviewed only one-third expressed any interest in FM as an area of opportunity and no indication was given of any change in that position over the next couple of years.

- Interestingly vendors expressed strong feelings on this market subsector from both a positive and negative standpoint as evidenced by such comments as:

  - "We see this area becoming more and more important".

  - "Not important at all".

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e.   USHS

- User site hardware services (USHS) can be analysed into two broad product areas:

  - Systems based on minicomputers or small mainframe systems.

  - PC-based systems.

- The non-PC-based systems can be considered as something of a halfway house between a FM approach and in-house processing on the one hand and between FM and RCS on the other.

- In this respect some increase in the market for USHS could be anticipated for basically the same reasons as enumerated for FM above.

- As in the case for FM there exists only a minority interest among vendors for non-PC-based USHS and this is clearly shown in Exhibit VI-7. In fact a decreasing interest was registered for the forward period to 1985 among the vendor sample.

- However, the opposite is the case for PC-based systems, a subsector of the market dubbed PC-RCS by INPUT.

- While vendors give PC-based USHS relatively low emphasis now, a significant increase in emphasis was forecast by 1985. By that time some 44% of vendors forecast a high emphasis on PC-based USHS services.

- A more detailed analysis of the trends and opportunities in the PC-based USHS area is provided in INPUT's report Personal Computer Opportunities for Remote Computing Services Vendors in Western Europe, published in November 1983.

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EXHIBIT VI-7

PROCESSING SERVICES VENDORS' EMPHASIS ON USHS

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Now

Non-PC-Based: 20% | 52% | 28%

PC-Based: 20% | 16% | 64%

By 1985

Non-PC-Based: 16% | 48% | 36%

PC-Based: 44% | 36% | 20%

0   20   40   60   80   100%

■ High Rating
▨ Medium Rating
▧ Low Rating
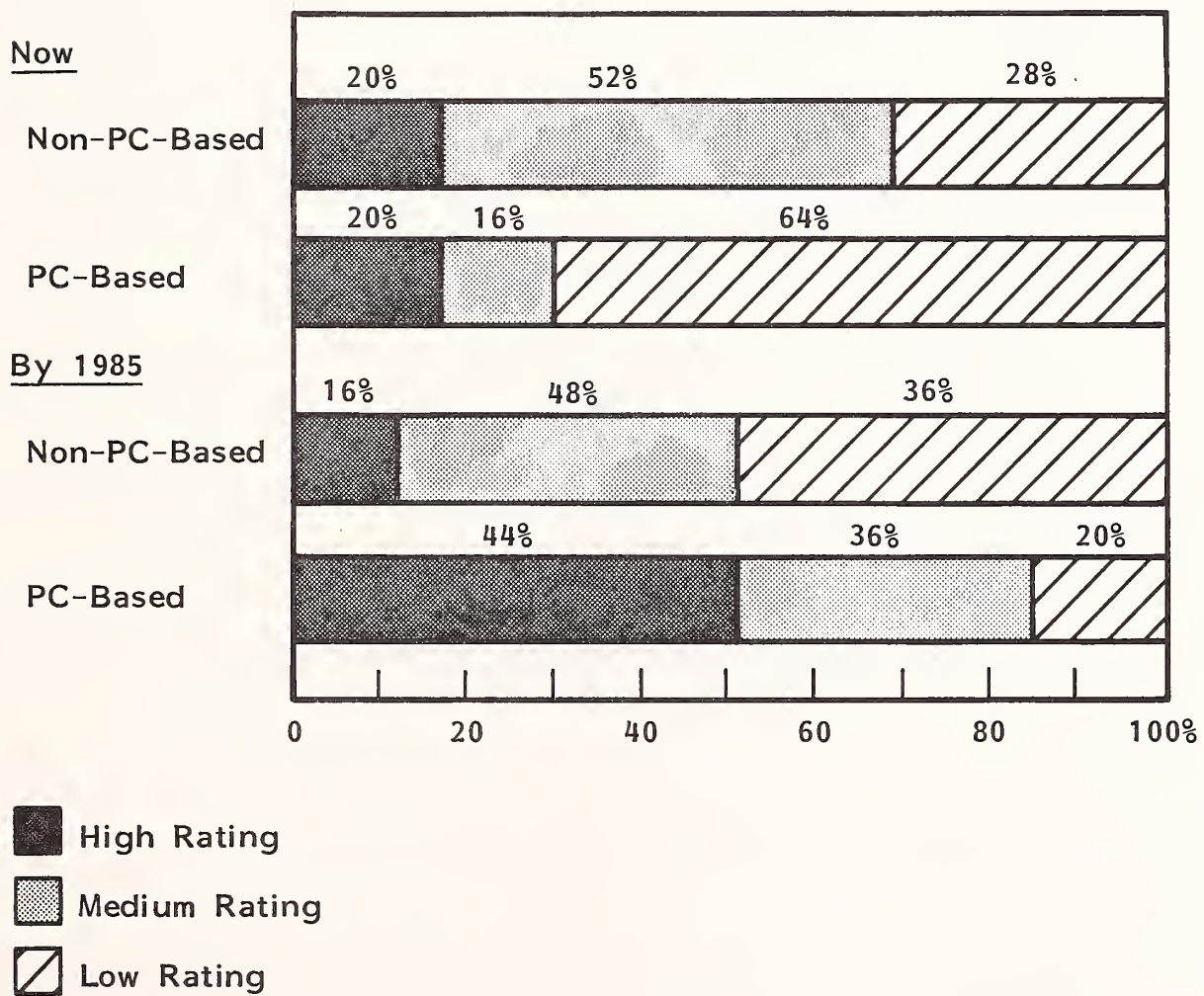
3.   PRICING APPROACHES

- Nearly all the vendors interviewed reported that the classic "resource use formula" approach is the primary method being used for pricing.

- For batch processing, particularly for accounting applications, charges are most frequently based on the number of lines processed.

- However, many vendors commented on the need for new pricing approaches that were in a number of cases being introduced albeit on a fairly limited scale.

- About 20% of the vendors interviewed were using a "fixed price" approach for some processing services. This is primarily a response to the relatively lower cost component represented by processing resources and to the users' desire for a known limit on expenditure.

- One vendor commented, "Users want to know what they are committed to".

- Another approach to this need is the provision of a fixed capacity service in order to limit expenditure within certain bounds.

- Two of the vendors were attempting to apply some kind of value assessment as a basis of pricing, albeit in a fairly subjective manner.

- Another factor that appears to be becoming more important is bundling into the price other services like consultancy and training.

- Around 44% of the vendors interviewed considered that there would have to be changes in their approach to pricing over the next couple of years.

- The remaining 56% did not see that need, one vendor commented, "There is no reason for it to change".

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4.   PROFITABILITY

● Closely related to the topic of pricing, profitability ranks high among vendor objectives.

● Many vendors mentioned increased manpower costs as a major obstacle to their profitability. One vendor commented, "Our costs are rising faster than our revenues".

● Vendors mentioned a number of methods that they were using to improve profitability:

  - Internal cost cutting.

  - Raising prices in line with inflation.

  - More focussed marketing.

  - Dispersing with the direct sales force and obtaining business through joint ventures.

  - Increasing individual sales quotas.

  - Avoiding market areas that are prone to external factors.

● Using third parties as a distribution channel was another innovative measure being considered with increasing interest.

● While only about 16% of the sample claimed to be using this form of sales channel at the moment, over 40% judged that they would be adopting this approach within the next two years.

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- The most frequently adopted approach by processing services vendors was internal cost cutting as a strategy to improve productivity.

- There was also strong evidence that most services companies had raised prices as far as they could to keep in line with inflation.

- It is clearly understood by vendors that a necessary condition for survival in the processing services marketplace is the need to offer a superefficient computing bureau service.

E.   COMPETITIVE ANALYSIS

- Exhibit VI-8 ranks the leading processing services vendors by market share in each of the four countries studied in this report. The market shares are estimated for the calendar year 1983.

- The fragmentation of the industry within Western Europe is clearly shown by the fact that of the 30 companies that rank within the top ten of these individual country markets:

    - Twenty-five appear in only one country's top ten listing.

    - GSI, CISI and Reuters are represented in two top ten listings.

    - GEISCO ranks in the top ten in three countries—Italy, the U.K. and West Germany.

    - Only one vendor, IBM-INS, appears in the top ten of all four countries.

- Across the four countries the top ten account for an average of about 50% of the market and the top 20 about 65% demonstrating a greater degree of consolidation than for the information services market as a whole.

EXHIBIT VI-8

TOP VENDOR RANKING AND SECTOR MARKET SHARES 1983
- PROCESSING SERVICES

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
FRANCE			ITALY		
1	CCMC	7.9%	1	IBM-INS	4.4%
2	GSI	7.7	2	GEISCO	3.6
3	CISI	7.4	3	CNI	3.6
4	SG2	5.8	4	Data Management	1.8
5	SLIGOS	5.7	5	GE-DA	1.7
6	Telesystemes	5.2	6	Auselda	1.5
7	IBM-INS	3.1	7	Sipe Optimation	1.4
8	GFI	2.6	8	Sopin	1.3
9	SPI	2.0	9	Cerved	1.2
10	SITB	1.4	10	System Printing	1.2
U.K.			WEST GERMANY		
1	Reuters	6.2%	1	Datev	13.7%
2	GEISCO	4.9	2	IBM-INS	7.7
3	IBM-INS	4.6	3	Taylorix	2.8
4	Datasolve	4.2	4	GEISCO	2.7
5	Centre File	4.0	5	GSI (Datel)	2.4
6	BARIC	3.0	6	Reuters	2.1
7	Comshare	3.0	7	Control Data	1.4
8	SIA (CISI)	2.9	8	A-C Service	1.3
9	Datastream	2.4	9	Fiducia	1.0
10	ADP	2.1	10	ICR	0.7

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- The figures for the whole market are 35% and 45% respectively.

- Clearly the international marketing strength of vendors like IBM-INS and GEISCO enable strong representation in many different country markets.

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VII SOFTWARE PRODUCTS

VII SOFTWARE PRODUCTS

A.   INTRODUCTION

- The software products sector is characterised by rapid growth, at 34% for Western European markets, the fastest growing sector within the information services industry.

- Consequently it is a highly attractive opportunity area for services vendors to achieve revenue growth and to establish themselves strategically within the industry.

- However, it is becoming increasingly clear that vendors must be careful in the selection of their markets if profitable businesses are to be built.

- The recent well-publicised problems of MSA, with its Peachtree microcomputer software division, is a case in point.

- To date, the markets for software have been dominated by the major hardware manufacturers. Unbundling policies applied to their large installed bases of equipment have contributed and continue to contribute to revenue growth in this sector.

- It is interesting to note however, that this has been driven primarily by revenues generated by system software; software products vendors have fared less well in selling application packages to their user base.

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- Exhibit VII-I provides a schematic representation of INPUT's classification of the software products market showing the definitions used for systems and applications software.

- The rapidly growing and dynamic market for software products is presenting some considerable challenges to software vendors. The following key issues are discussed separately in Section D below:

  - High levels of competition requiring more effective sales and marketing methods.

  - Business opportunities.

  - Growth rates.

  - Profitability and pricing.

  - Service and support.

  - Product reliability and performance.

  - The competition faced by independent vendors from the hardware manufacturers.

B.   MARKET DEVELOPMENT, 1984-1989

- The Western European markets for software products are characterised by rapid growth. It is anticipated that the 1984 market will reach $2.3 billion up by 30% from the $1.8 billion achieved in 1983.

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EXHIBIT VII-1

SOFTWARE PRODUCTS MARKET STRUCTURE

Software Products

Systems Software

Systems Control
- Access Control
- Communications Monitors
- Network Control
- Operating Systems
- Security Systems
- System Library Control
- Other

Data Center Management
- Capacity Management
- Computer Operations Scheduling
- Data Center Management
- Disk Management
- Downtime/Repair Monitoring Management
- Job Accounting
- Performance Monitors
- Tape Management
- Utilities
- Other

Applications Development

Program Development and Production Tools
- Application Generators
- Assemblers
- Automatic Documentation
- Compilers
- Debugging Aids
- Languages
- Systems Development Control
- Retrieval Systems
- Translators
- Other

Data Base Management Systems
- Data Base Management Systems
- Data Dictionaries
- Other

Applications Software

Cross-Industry

Accounting
- Accounts Payable
- Accounts Receivable
- Fixed Assets
- General Ledger
- Purchasing
- Other

Human Resources
- Benefits
- Payroll
- Personnel
- Training & Education
- Other

Education and Training
- Computer-Assisted Instruction
- Authoring Languages
- Video Instruction
- Live Instruction
- Other

Planning and Analysis
- Budgeting
- Financial Planning
- Forecasting
- Modeling
- Other
- Spreadsheet Systems
- Integrated Analysis Systems
- Graphics

Other
- Administrative Services
- Corporate Services
- Graphics
- Sales, Marketing and Distribution
- Word Processing
- Other

Engineering and Scientific
- Structural
- Chemical
- Electrical
- Mechanical
- Piping
- Project Control
- Nuclear
- Statistics/Operations Research
- Other

Industry-Specific
- Banking & Finance
- Discrete Manufacturing
- Education
- Federal Government
- Insurance
- Medical
- Process Manufacturing
- Retail
- Services
- State & Local Government
- Transportation
- Utilities
- Wholesale
- Other

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- It is expected that annual average growth rates for this market will continue around this level over the forecast period. Growth will accelerate in the short-term up to 1986 and then decline.

- Exhibits VII-2 through VII-6 are summary tables of forecast growth for the software products markets in Western Europe and the four individual country markets.

- Hardware manufacturers will continue to drive revenues in this sector upward as they seek to shift their balance of revenues from hardware to software.

- In general, manufacturers will remain much stronger in systems software than in applications products.

- Increased availability and acceptance of "low cost" systems in smaller business will generate high demand for applications.

- Larger and larger memory and more powerful processors are continuously widening the potential catchment area as viable systems become relatively less costly.

- A fall-out of "bad" or "poor" software products and vendors could impact the overall market size within the next few years.

- Related to this will be the problems of poor documentation and the inability of some software suppliers to provide cost-effective support and maintenance.

- Vendors who cannot solve these problems will fall by the wayside.

- The sheer size of recent growth rates in this sector is likely to be maintained and some fall-off is considered inevitable.

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EXHIBIT VII-2

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1989
- WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Hardware Manu-facturers						
Systems	$ 949	$1,138	23%	$1,755	24%	$3,379
Applications	192	232	26	384	26	773
Subtotal	$1,141	$1,370	23%	$2,139	25%	$4,152
Independents						
Systems	203	291	40	555	31	1,243
Applications	455	683	48	1,466	38	3,860
Subtotal	$ 658	$ 974	45%	$2,021	36%	$5,103
Total Market						
Systems	1,152	1,429	26	2,310	26	4,622
Applications	647	915	42	1,850	36	4,633
Total	$1,799	$2,344	32%	$4,160	30%	$9,255

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EXHIBIT VII-3

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1989
- FRANCE

SUBSECTOR	MARKET FORECAST (French Francs (FF) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Hardware Manu-facturers						
Systems	2,168FF	2,735FF	26%	4,346FF	26%	8,804FF
Applications	383	490	28	812	29	1,736
Subtotal	2,551FF	3,225FF	26%	5,158FF	27%	10,540FF
Independents						
Systems	625	843	34	1,510	32	3,446
Applications	1,155	1,833	53	4,114	41	11,487
Subtotal	1,780FF	2,676FF	47%	5,624FF	38%	14,933FF
Total Market						
Systems	2,793	3,578	28	5,856	28	12,250
Applications	1,538	2,323	47	4,926	39	$13,223
Total	4,331FF	5,901FF	35%	10,782FF	33%	25,473FF

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EXHIBIT VII-4

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1989
- ITALY

SUBSECTOR	MARKET FORECAST (Lira (£) Billions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Hardware Manu-facturers						
Systems	£276	£362	32%	£ 634	30%	£1,393
Applications	69	90	34	168	30	372
Subtotal	£345	£452	32%	£ 802	30%	£1,765
Independents						
Systems	67	118	55	248	31	560
Applications	79	149	78	445	50	1,495
Subtotal	£146	£267	74%	£ 693	44%	£2,055
Total Market						
Systems	343	480	41	882	30	1,953
Applications	148	239	60	613	45	1,867
Total	£491	£719	47%	£1,495	37%	£3,820

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EXHIBIT VII-5

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1989
- UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Hardware Manu-facturers						
Systems	£187	£231	23%	£349	24%	£ 671
Applications	41	52	26	83	27	170
Subtotal	£228	£283	24%	£432	25%	£ 841
Independents						
Systems	30	48	50	102	33	239
Applications	108	166	45	332	33	786
Subtotal	£138	£214	46%	£434	33%	£1,025
Total Market						
Systems	217	279	28	451	26	910
Applications	149	218	41	415	32	956
Total	£366	£497	33%	£866	29%	£1,866

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EXHIBIT VII-6

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1989
- WEST GERMANY

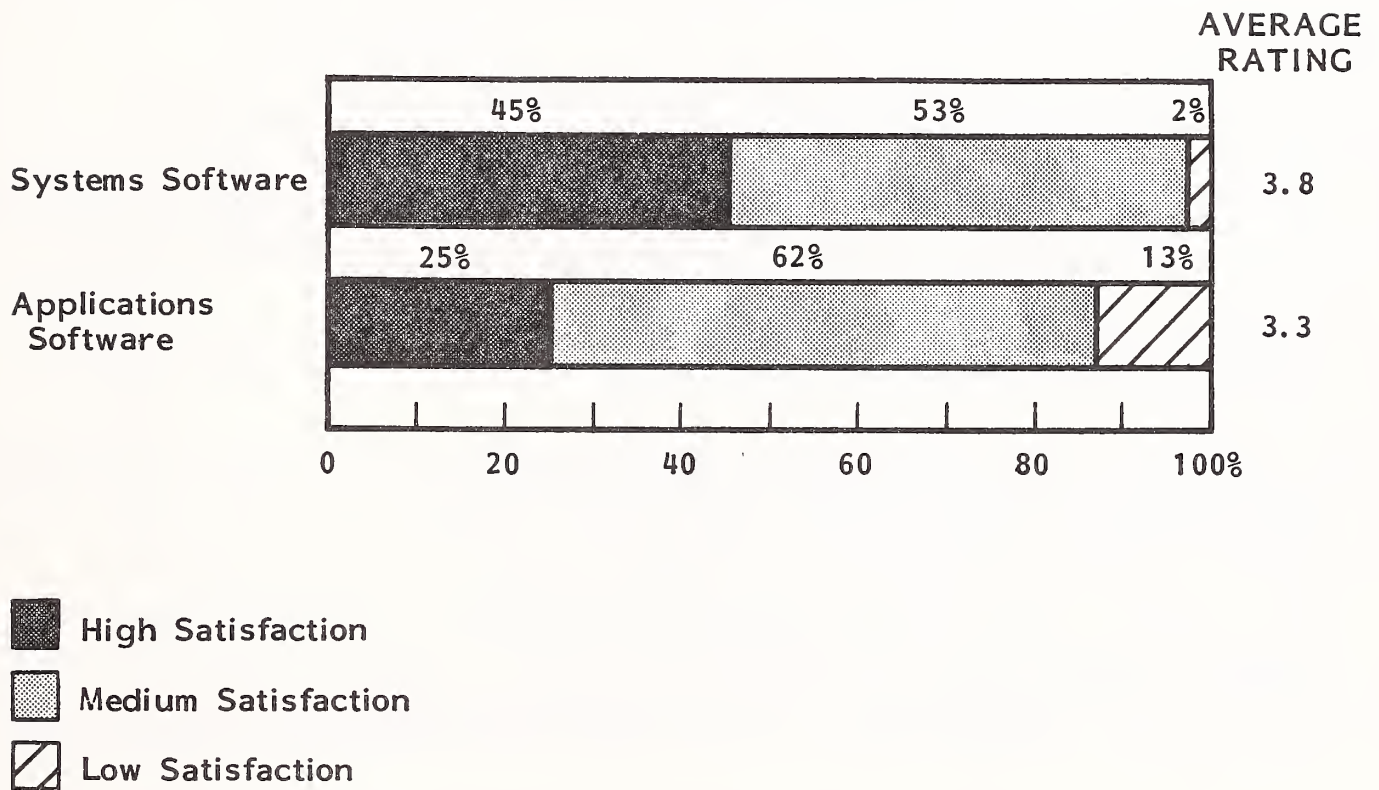| SUBSECTOR	MARKET FORECAST (Deutsche Marks (DM) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Hardware Manu-facturers						
Systems	818DM	1,014DM	24%	1,562DM	24%	3,009DM
Applications	153	185	28	318	26	639
Subtotal	971DM	1,199DM	25%	1,880DM	25%	3,648DM
Independents						
Systems	148	214	42	420	35	1,030
Applications	374	555	45	1,138	40	3,135
Subtotal	522DM	769DM	44%	1,558DM	39%	4,165DM
Total Market						
Systems	966	1,228	27	1,982	27	4,039
Applications	527	740	40	1,456	37	3,774
Total	1,493DM	1,968DM	30%	3,438DM	32%	7,813DM

- The growth of the market will also be affected by the ability of vendors to reach the full price potential of their products through value pricing.

C.   USER ATTITUDES AND TRENDS

- The general level of satisfaction with software products registered by the user sample is shown in Exhibit VII-7. (Note also Exhibit V-10 above.)

- Systems software at an average rating of 3.8 was distinctly higher than that for applications software which rated 3.3.

- There was a general tendency for users to place preference on the manufacturers systems software as typified by the comment of one user, "The manufacturers' software is best".

- However, this view must be balanced against the increasing sales of specialised system software products, like relational database management systems, particularly in the IBM and IBM-compatible market.

- As is often the case, users, when asked to comment on their level of satisfaction with software, were more forthcoming concerning problems experienced than in giving praise.

- Favourable comments included:

    - "Quick-build development tools are becoming good".

    - "A wide variety of software is now available".

    - "Software products are usually reasonably stable".

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EXHIBIT VII-7

USER SATISFACTION LEVELS WITH SOFTWARE PRODUCTS

AVERAGE
RATING

Systems Software — 45% / 53% / 2% — 3.8

Applications
Software — 25% / 62% / 13% — 3.3

0   20   40   60   80   100%

■ High Satisfaction

▦ Medium Satisfaction

▨ Low Satisfaction

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- Typical of the unfavourable comments by users were the following:

  - "Reference manuals, particularly from IBM, are difficult to follow".

  - "Support could be better in most cases".

  - "Software suppliers seem only to have a superficial knowledge of their products".

  - "Many packages are not sufficiently industry oriented".

  - "The product was difficult to install but now functions well".

- Some indication of opportunity areas for software products can be gained from the users data processing plans analysis given in Exhibit V-4 above.

- The following areas are of note:

  - An emphasis on on-line applications taking over from batch applications.

  - The relatively high priority being placed on distributed data processing.

  - High priority for the development of the information centre concept.

  - A marked increase in the development of office automation systems in the period up to 1986.

- Interestingly, fourth-generation languages and obtaining improvements in DP personnel productivity were given relatively low priority by the users sampled.

- This seems at odds with the high ranking attributed to excessive applications backlog and excessive applications development time, as shown in Exhibit V-5.

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- Clearly the take-up of new application development methods is still relatively slow amongst data processing management and most faith is being placed on the development of an information centre concept.

- In terms of future application development the two areas of highest planned activity (see Exhibit V-6) are:

  - Production/inventory control.

  - Accounting/finance.

- In comparison with the user's current applications profile the highest growth was anticipated in the area of industrial/manufacturing control, closely followed by production/inventory control.

- In contrast a marked decline was indicated for personnel/payroll type applications.

- Users were also questioned about their attitude towards new application development, whether to build in-house or to purchase from outside.

- The results tabulated in Exhibit V-8 indicated that the areas of highest interest for outside purchase were:

  - Personnel/payroll.

  - Accounting/finance.

- Areas of least interest were:

  - Order entry/billing/purchasing.

  - Marketing/sales.

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- Overall, users still favoured in-house development over purchasing an applications package by a margin of two to one.

D. VENDOR ISSUES

1. MARKETING

- The software products sector of the information services industry is in the vanguard of the development of new marketing methods.

- The high levels of competitive activity being met within the software products market were a major concern of the software vendors interviewed.

- It is this high level of competitive activity that has largely been responsible for creating the need for more sophisticated marketing and sales methods.

- Clearly this marketing challenge is fiercest at the low end of the market, selling software for personal computers.

- In these markets very high advertising budgets are commonplace as vendors seek to establish a unique identity amongst a multitude of competing products.

- Even at the high-value low-volume end of the market where the traditional salesforce is a necessity there is increasing interest in advertising, the use of seminars, mail shots and telephone selling as methods of increasing marketing efficiency and obtaining higher productivity from the salesforce.

- Of the 26 vendors that commented on the costs of sales and marketing 14 felt that costs were higher than in the past.

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- Nine of these vendors were able to quote a percentage cost increase figure and these ranged from 1.5% to 12% per annum with the average of the figures quoted being 9%.

- Typical reasons given for these increases in sales and marketing costs were:

  - Increased marketing expenses particularly advertising.

  - The need to provide professional services type support in order to achieve sales.

  - Greater levels of competition.

- A more detailed analysis of the information services industry's adoption of new marketing techniques is provided in INPUT's report <u>Marketing Methods that Increase Sales</u> published in June 1984.

2. BUSINESS DEVELOPMENT

- The high growth in user expenditure on software products makes this sector of the services industry highly attractive.

- However, INPUT considers that vendors should choose product opportunities with care since there are many pitfalls and success is not guaranteed even in a market growing as rapidly as this.

- The profusion of software products available include a number that are ill-conceived and presented without careful marketing plans.

- Three key growth markets for independent vendors stand out:

  - The market for system software for IBM and IBM-compatible systems. The vast size of the installed base presents an enormous opportunity.

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(The size of the DEC installed base is also of increasing interest to vendors in this respect.)

- The applications software market because so many opportunities are offered for specialisation. Consequently the manufacturers tend to be limited by their need to address mass markets on an international scale.

- The microcomputer and personal computer market is showing such rapid growth that it is of increasing interest to most vendors (business and scientific applications only are considered, INPUT does not measure the home or games computer market).

● The growth of the market for applications products is not expected to be even across all subsectors. INPUT is forecasting a rapid growth in the market for applications packages on small systems.

● In contrast a move away from packaged solutions towards customised solutions for large organisations has been detected. Vendor comments on this included:

- "There is a move to more bespoke systems for larger customers who are disillusioned with packages".

- "Our clients seem to want tailored software instead of standard packages".

● Another market that was clearly of interest to many software vendors was that of standard operating systems and the consequent portability of software packages that results.

● Some vendors reported that development of packages that run under UNIX had already commenced and this was seen as a considerable opportunity.

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- Clearly MSDOS and CP/M have created enormous markets in the personal computer segment and there is a general feeling amongst vendors the same situation will apply further up-market for UNIX/XENIX systems.

- One vendor commented that this was considered even more likely following IBM's recent announcement of XENIX for the PC/AT.

- INPUT considers that UNIX is unlikely to gain the wide acceptance in the commercial area often forecast for it.

- Vendors should evaluate alternative environments, such as PICK, which may well prove to be a sounder long-term proposition for the support of business applications.

- The individual country market nature of the Western European market also creates certain business development opportunities in respect of adapting foreign software products for the local market.

3. GROWTH RATES

- The high growth rate of the market for software products overall is not necessarily realised by all vendors.

- The individual vendors growth rate is a function of a number of factors, the principal ones being:

    - The innate attractiveness or usefulness of the products offered by the vendor.

    - The relative technical merit of its products.

    - The size and growth rates of the particular markets being targetted.

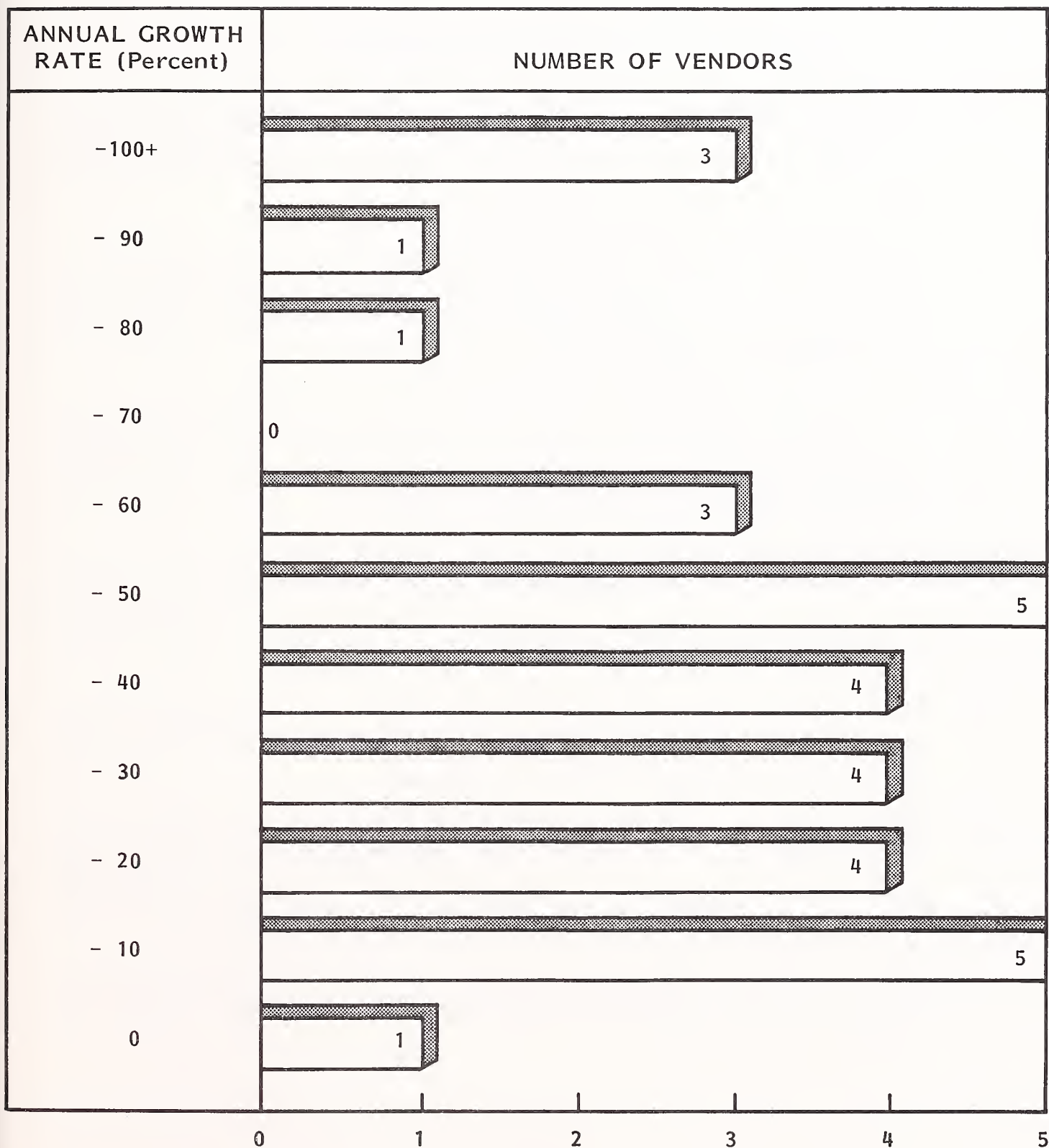   - The size, financial strength and marketing savvy of the vendor.

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- Exhibit VII-8 shows the distribution of growth rates currently being recorded by the vendors included in this sample.

- Clearly some very high growth rates are being achieved although it must be pointed out that it is generally in the start-up operations that these occur.

- Individual growth rates ranged from 0% to 300% and the average for all vendors interviewed was 49.5%.

- It can be anticipated that these high growth rates will not be maintained over the next few years by all vendors, as product life cycles and the organisational problems of growth come into force.

- Several vendors commented on this and forecast a fairly rapid fall in the growth rate for their own companies, one for example currently growing at 60% per annum saw this rate dropping to 20% over the next two years.

- Some other vendors were very bullish and were planning to maintain their high growth, one for example planned to maintain 50% per annum growth for the next three years.

4.   PROFITABILITY AND PRICING

- Out of the 33 vendors who reported on software products as part of their business, 21 made specific comments on the impact of fast growth on profitability.

- Eleven of these stated that they had either experienced no adverse effect of rapid growth or that profits had actually increased as a result.

- The remaining ten reported that profits had been adversely affected by fast growth or by the need to invest more in software product development.

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EXHIBIT VII-8

DISTRIBUTION OF INDEPENDENT SOFTWARE PRODUCT VENDORS' GROWTH RATES

ANNUAL GROWTH RATE (Percent)	NUMBER OF VENDORS
−100+	3
− 90	1
− 80	1
− 70	0
− 60	3
− 50	5
− 40	4
− 30	4
− 20	4
− 10	5
0	1

0   1   2   3   4   5

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- Typical of comments from vendors in this situation were:

  - "Our profit is impacted because of the service element".

  - "The development cost of new products has had a negative impact".

  - "Investment growth has impacted profitability".

- A key concern amongst many vendors in respect of profitability is the ability to maintain a fair price for the product in order to recover its development cost.

- These vendors considered that customers perceive a reasonable price for a software product as a direct function of the price of the hardware upon which it is to be run.

- While this has tended to favour vendors of software being sold at the top end of the market, the rapid emergence of much very low cost hardware has undermined some previously established positions.

- Nevertheless, users are prepared to pay high prices for software products where very clear benefits or cost savings can be achieved and where there is a very high need for the system.

- Consequently, there exists considerable scope for value pricing and a number of vendors indicated that this was their approach.

- At the low end of the market high levels of competition make pricing decisions difficult, one vendor summed it up as "it must be low enough to be attractive but high enough to make a profit, it is a fine balance".

- Clearly positioning a product against competition is a major influence on vendor pricing decisions.

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5. COMPETITION WITH MANUFACTURERS

- The dominant position held by hardware manufacturers in the software products market has been generated primarily by unbundling policies.

- Given the relative decline of hardware and the relative increase in software as a proportion of the data processing budget it could be expected that hardware manufacturers would become much more aggressive competitors in this market.

- This view was confirmed by the vendor sample--27 of the 33 software companies reported on this issue.

- Of those 27, 16 (59%) reported that they were facing increased competition from hardware manufacturers and a further nine reported that they had detected no change.

- Interestingly, two independent vendors felt that competition from the manufacturers had actually decreased. This was entirely due to the fact that they had signed collaborative agreements with manufacturers.

- Indeed several vendors put forward the proposition that more collaboration with manufacturers was their strategy for countering their increased competitive presence.

- Manufacturers are clearly anxious to expand their sales of software products, particularly application systems.

- However, they are most likely to aim at sizable high-growth markets like manufacturing control. They are unlikely to be interested in meeting the more specific needs of specialist submarkets within these broad groupings.

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- These submarkets thus represent prime targets for independent companies. One vendor commented, "We are countering competition from manufacturers by specialising in niche markets and providing excellent software and expertise".

- Other strategies propounded by vendors were primarily related to the provision of a "service concept" that manufacturers would find difficult to match.

- Offering more and better services along with software products, after-sales services, fast response to clients and a "total solution--solving the problem" approach were all mentioned by vendors.

- One vendor felt that the answer lay in producing better products.

6.   SERVICE AND SUPPORT

- One of the major concerns for software product vendors, both hardware manufacturers and independent vendors, is the provision of good service and support at an economic cost.

- Two much discussed methods which are promoted for this purpose are:

    - Phone-in support centres.

    - Remote fault diagnosis.

- Vendors were questioned on their use or planned use of these approaches and the results, for the 30 vendors who responded to this particular issue, are tabulated in Exhibit VII-9.

- Phone-in support centres have become a popular method for servicing software problems with 57% of vendors reporting current use and a further 17% having plans to adopt it in the future.

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EXHIBIT VII-9

SOFTWARE VENDORS' USE OF
CENTRALISED SUPPORT/SERVICE TECHNIQUES

Phone-In
Support Centres

Remote Fault
Diagnosis

Currently Using

Plan to Use

No Plans to Use

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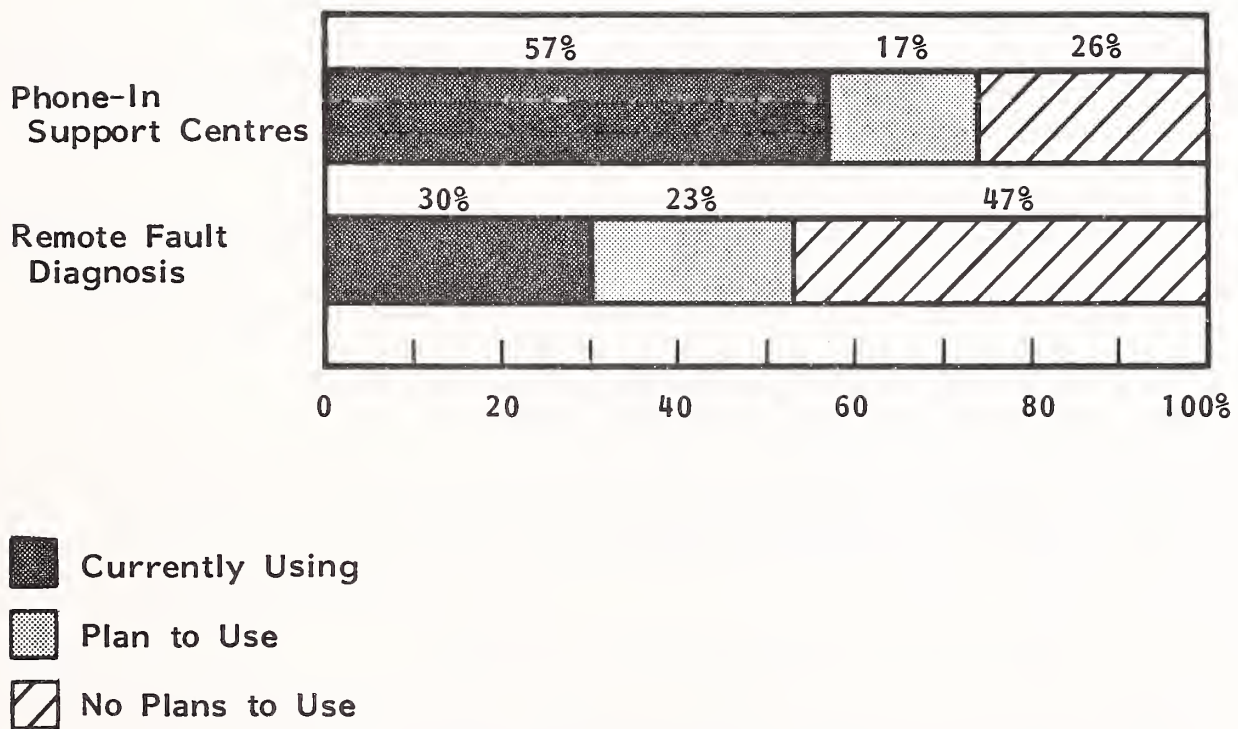
- Remote fault diagnosis was much less widely practiced with just under one-third of the sample reporting its use and a further 23% planning to do so.

- A number of vendors expressed considerable caution over the use of remote fault diagnosis techniques because of its security aspects.

- However, given the increasing numbers of machines that are run without professional data processing support staff this approach may become increasingly popular providing adequate safeguards can be built in to protect user data security.

- For some vendors the real issue in servicing and support problems is tackling it at a more fundamental level.

- This means eliminating most requests for help and support from customers through measures such as:

  - Developing more reliable/higher quality products.

  - Providing customers with access to more information on the products through more comprehensive documentation.

  - Developing or improving HELP facilities.

  - Improved and more available user training.

- The aim of these measures being to maximise "auto-maintainability" and minimise vendor support costs.

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E. COMPETITIVE ANALYSIS

- Exhibit VII-10 ranks the leading independent suppliers of software products by market share of all software products user expenditures in 1983 for each of the four individual country markets.

- The fragmented nature of the market positions of the independent vendors is illustrated by:

    - The fact that no independent software companies are represented in more than one individual country market with two exceptions, Cincom in France, the U.K. and West Germany and Computer Associates in France and West Germany.

- In each market the top ten independents account for between 24% and 32% of the market. The largest individual country market share is held by Software AG with 8.1% in West Germany.

- The occurrence of U.S.-based organisations like CINCOM, MSA and Computer Associates indicates the growing importance of these major vendors in meeting the software needs of the IBM user population and to a lesser extent those of DEC installed bases.

- The emergence of Digital Research in tenth place in the U.K. listing emphasises the rapidly developing presence of personal computer software vendors in the software marketplace.

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EXHIBIT VII-10
TOP VENDOR RANKING AND SECTOR MARKET SHARES 1983
- SOFTWARE PRODUCTS (INDEPENDENTS)

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
FRANCE			ITALY		
1	SEMA	4.6%	1	Data Management	6.1%
2	CGI	4.1	2	O-DATI	3.7
3	Cap Gemini Sogeti	3.9	3	Syntax	3.2
4	Cincom	1.9	4	Formula	3.1
5	Sligos	1.8	5	Selesta	2.0
6	Steria	1.7	6	CNI	2.0
7	SPI	1.6	7	CDS Sistemi	1.9
8	Answare	1.6	8	Tekno Consult	1.6
9	SOPRA	1.5	9	Datamat	1.3
10	Computer Associates	1.5	10	SSS	1.3
U.K.			WEST GERMANY		
1	Hoskyns	3.1%	1	Software AG	8.1%
2	ADR	2.9	2	Softlab	3.8
3	Cincom	2.8	3	SAP	3.4
4	Logica	2.6	4	ADV/ORGA	3.3
5	MSA	2.3	5	MBP	3.0
6	PPL	2.2	6	Taylorix	2.9
7	Thorn-EMI	2.1	7	Cincom	2.7
8	McCormack & Dodge	2.0	8	ACI-UCCEL	1.8
9	Peterborough	2.0	9	Computer Associates	1.7
10	Digital Research	1.8	10	SCS	1.5

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VIII PROFESSIONAL SERVICES

VIII PROFESSIONAL SERVICES

A. INTRODUCTION

- In 1983 professional services constituted 29% of the Western European information services market and was the second largest sector.

- The professional services market is defined by INPUT as consisting of four principal subsectors:

  - Consultancy.

  - Tailored software development.

  - Contract programming and other services.

  - Education and training.

- Growth in this market is forecast to be around 23% per annum in the period up to 1989.

- The increased complexity of systems is leading to an increased use of consultancy and system development services by organisations that either do not have that expertise in-house or are wishing to supplement their existing resources.

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- The growing realisation among senior management that information-processing capability has increasingly a strategic position in their affairs is leading to the demand for medium- and long-term strategic consultancy assignments.

B.   MARKET DEVELOPMENT, 1984-1989

- Exhibits VIII-I through VIII-5 provide summary tables of the forecast professional services market growth between 1984 and 1989, for Western Europe and the individual country markets.

- High annual average growth of around 23% per annum will be driven by a number of factors.

- Demand for customised software systems by large users will increase as they face:

    - More complex system requirements.

    - Need to optimise their use of the most sophisticated techniques available, e.g., relational database.

    - Staff/expertise shortages.

- This will drive increased use of professional services probably utilising such techniques as Logica's "system kernels" approach and other productivity aids.

- The increasing application of computers by a larger and larger body of "non-computer literate" people will feed an increasing demand for:

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EXHIBIT VIII-1

PROFESSIONAL SERVICES MARKET FORECASTS, 1984-1989
- WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Consultancy	$ 277	$ 316	14%	$ 410	17%	$ 658
Software Development	1,536	1,840	23	2,866	24	5,494
Contract Programming and Other	319	380	20	555	21	978
Education and Training	259	313	25	505	27	1,038
Sector Total	$2,391	$2,849	22%	$4,336	23%	$8,168

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EXHIBIT VIII-2

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1989
- FRANCE

SUBSECTOR	MARKET FORECAST (French Francs (FF) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Consultancy	742 FF	870 FF	18%	1,220 FF	20%	2,125 FF
Software Development	5,860	7,266	25	11,422	25	22,576
Contract Programming and Other	1,119	1,393	24	2,120	23	3,947
Education and Training	552	720	29	1,192	30	2,609
Sector Total	8,273 FF	10,249 FF	24%	15,954 FF	25%	31,257 FF

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EXHIBIT VIII-3

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1989
- ITALY

SUBSECTOR	MARKET FORECAST (Lira (£) Billions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Consultancy	£ 48	£ 63	31%	£108	31%	£ 244
Software Development	221	307	39	593	39	1,609
Contract Programming and Other	72	99	35	178	35	437
Education and Training	27	39	42	77	40	212
Sector Total	£368	£508	37%	£956	38%	£2,502

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EXHIBIT VIII-4

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1989
- UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Consultancy	£ 75	£ 89	10%	£101	14%	£ 148
Software Development	331	424	29	718	25	1,417
Contract Programming and Other	53	66	22	96	20	168
Education and Training	62	77	26	125	27	254
Sector Total	£521	£654	26%	£1,040	24%	£1,987

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EXHIBIT VIII-5

PROFESSIONAL SERVCIES MARKET FORECAST, 1984-1989
- WEST GERMANY

SUBSECTOR	MARKET FORECAST (Deutsche Marks (DM) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
Consultancy	182DM	215DM	17%	294DM	16%	459DM
Software Development	821	974	19	$1,392	22	2,543
Contract Programming and Other	220	259	18	362	17	582
Education and Training	274	337	24	526	25	1,033
Sector Total	1,497DM	1,785DM	19%	2,574DM	21%	4,617DM

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- Education and training.

- General consultancy advice.

- Continuing support.

● Data processing management consultancy will be much in demand as organisations seek to ensure that they have adequate data processing plans, that they are fully benefiting from the convergence of computers and communications and that they are positioned to make good use of new technical advances.

● Shortages of skilled computer professionals are likely to be the biggest inhibitor on the growth of the professional services market.

C.   USER ATTITUDES AND TRENDS

● There now exists wide acceptance by users of the need for and usefulness of professional services.

● The increased complexity of the technology is forcing users to seek more outside help and guidance in its application.

● Additionally as the industry matures a greater emphasis on the services element is evident.

● The general level of user satisfaction for professional services was 3.3, as shown above in Exhibit V-10. A profile of user satisfaction was recorded for three of the four subsectors of this market and is shown as Exhibit VIII-6.

● This profile indicates that in general professional services are not very highly rated by users. Over 60% rated services at medium satisfaction while only

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EXHIBIT VIII-6

USER SATISFACTION WITH PROFESSIONAL SERVICES

				AVERAGE RATING
Consultancy	22	67	11	3.2
Software Development	28	61	11	3.3
Education and Training	28	61	11	3.3

0   20   40   60   80   100%

■ High Satisfaction

▨ Medium Satisfaction

☐ Low Satisfaction

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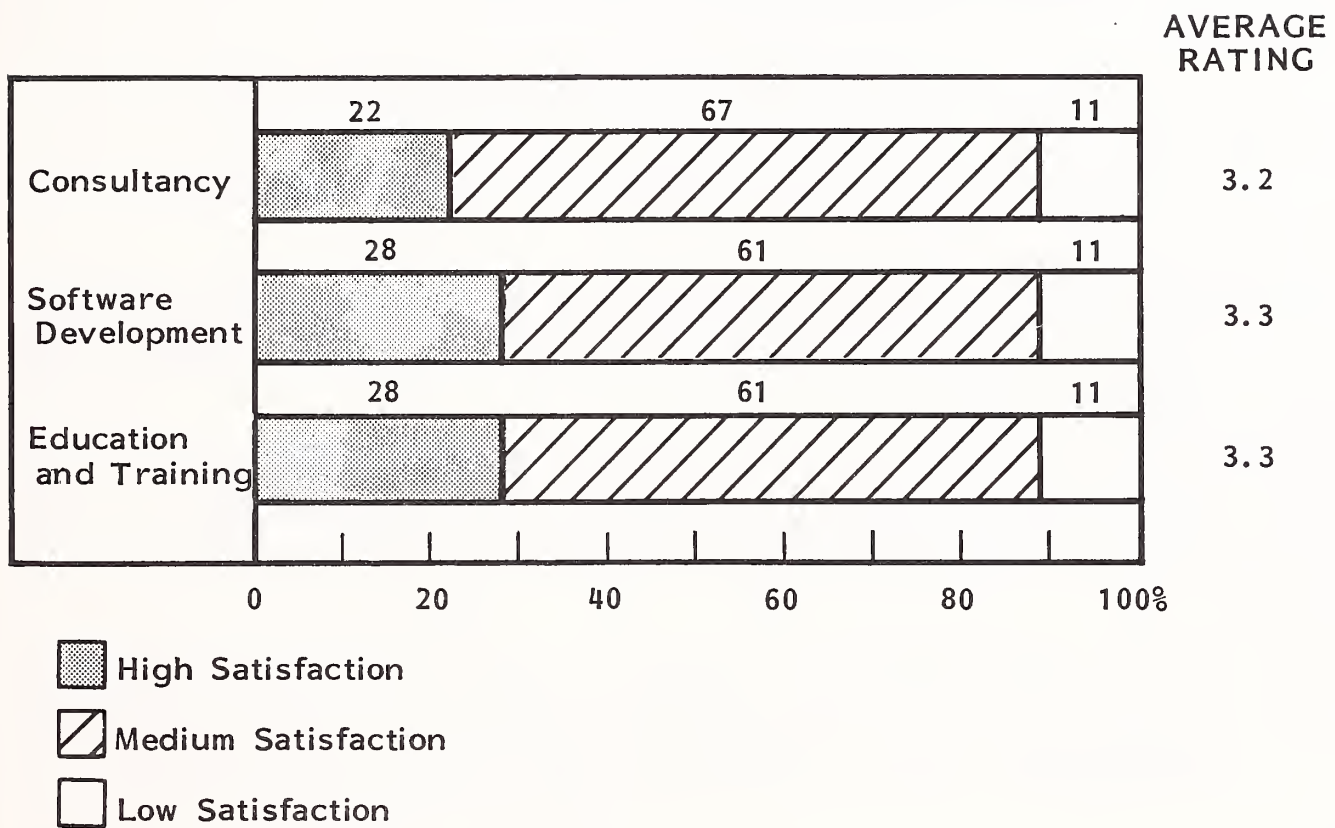
28% rated software development and education and training at high satisfaction. In the case of consultancy high satisfaction was recorded by only 22% of the user sample.

- One area of criticism that was mentioned by several users related to the quality and expertise of the staff of professional services companies.

- The following comments were made by users on this topic:

    - "They had inadequate development staff".

    - "There are very few real experienced professionals around".

    - "The quality varies a great deal".

- Several users thought that professional services tended to be somewhat expensive; one in particular stated that outside training was too costly for their organisation.

- Other comments included the difficulty of choosing a consultancy, one user commenting "the level of expertise is difficult to assess at the outset".

- Another problem mentioned was that of a consultancy being too theoretical in its approach, and not sufficiently related to the user organisation's real practical problems. One user commented "usually they are too generalised".

- However, despite these criticisms it was clear that many users have a high need for professional services and that these needs are anticipated to increase in the future.

D. VENDOR ISSUES

- Within the total vendor sample of 56 information services companies, 44 offered professional services of same kind. Of these 44, 29 completed the vendor issues section of the questionnaire.

1. CONSULTANCY TRENDS

- In terms of specific areas of consultancy two-thirds of the vendors (66%) provided clients with general implementation advice.

- Equipment selection services and feasibility studies were also important with around 60% of vendors reporting activity in each case.

- Specialist performance measurement services were only being provided by 30% of the vendors included in this sample.

- Other types of consultancy being offered were based around the following more specialist areas:

    - Communications.

    - Scientific computing.

    - Operational management.

    - Capacity planning.

    - General EDP management.

    - Security and disaster recovery.

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- Quality assurance of software development.

- Large project management.

- Software engineering.

- Database design.

- Consultancy trends will also tend to follow new developments in the industry. These provide good opportunities for professional services companies providing they can develop or build up the relevant expertise.

- Many opportunities will continue to arise out of the general skills shortages in the industry and these shortages will be particularly acute in new and specialist areas.

- One of the major consultancy trends in the industry today is towards strategic EDP consulting.

- This is in response to the increasing importance of information processing to the operation of an organisation and the increasing complexity and available options of the technology.

- One vendor reported that they were increasingly being contacted by larger organisations who required the development of long-term EDP scenarios.

- Another vendor commented, "People are asking for plans and directions". Users are seeing the need to develop total information systems incorporating, for example, decision support systems.

- The right type of system is seen by many users as being critical to achieving effective management control.

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- Complete strategy studies are a response to a complete rethinking of computer and telecommunications use that is taking place in many large organisations.

- Network strategies, for example, are becoming increasingly important.

- Office automation was another area where vendors were reporting interest in consultancy assignments. The concerns that companies have over telecommunications policy, particularly LANs, are very relevant to this area.

- One vendor comment on this was, "Users see a bewildering array of equipment".

- Another dimension of opportunity for consultancy services lies in meeting the needs of specific vertical markets such as manufacturing and banking.

- Increasing technical specialisation is also likely to become an important trend.

2. CONTRACT TYPES

- Among the various types of contracts offered by professional services these main types stood out:

  - Fixed price contracts were offered by 80% of the vendors interviewed.

  - Time and materials type contracts were offered by 77%.

  - Body hire was offered by 46%.

- Additionally a number of the larger companies offered "turnkey" contracts in relation to software development.
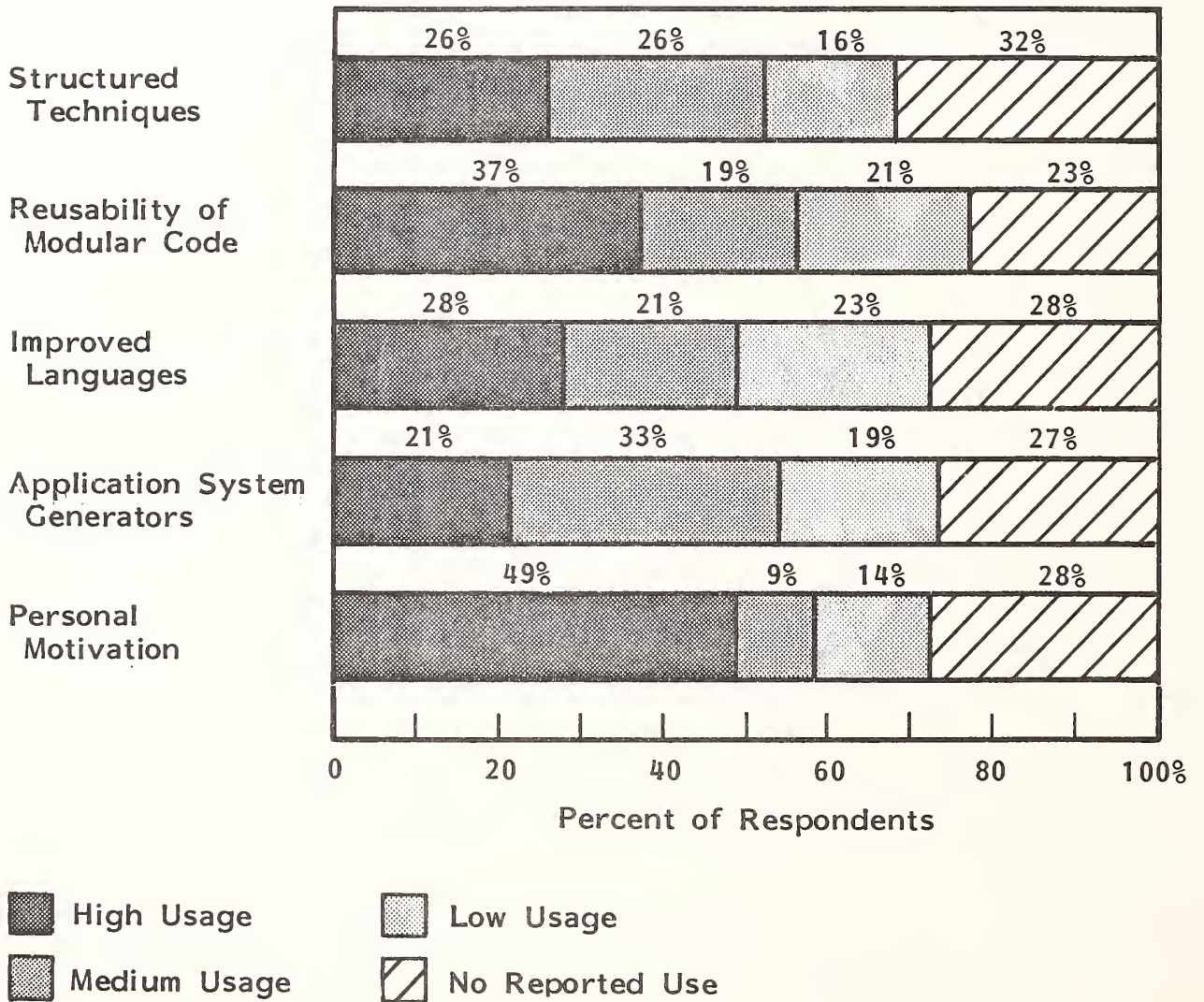
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- Vendors also reported using other methods, namely:

    - Government-specified procedures.

    - Cost-plus.

    - Success-oriented.

- In this latter case the contract was designed around the achievement of particular objectives, e.g., reduced stock levels, manpower, etc.

- A number of the vendors interviewed viewed the supply of professional services as a supportive function to other information services. Relevant vendor comments on this were:

    - "Consultancy is used as a means to an end".

    - "Selling people is not seen as a key activity, it is important in order to study other areas".

- Although "body hire" was offered by 46% of the sampled vendors, few placed any great emphasis upon it. It was seen as essentially an additional feature, leveraging the people assets when commitments allowed.

- To cope with shortages of staff some companies will use free-lance staff, but one-third of all vendors stated they never used this approach.

- Only a minority, about 15%, stated that they frequently used free-lance staff. Some of these vendors had a specific policy to use free-lance staff.

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3.   PRODUCTIVITY APPROACHES

- Exhibit VIII-7 illustrates the varying use profiles of productivity techniques found among the vendors interviewed.

- Personal motivation stands out as the most significant and it was given much emphasis by many vendors.

- Reusability of modular code was seen as the next most important influence. This approach appears to be increasing in popularity, which may be partly due to Logica's success with this approach which they term "system kernels".

- Lower emphasis was placed on improved languages, structured techniques and application system generators.

- One vendor did however comment that in his opinion application system generators were going to become much more widely used before long.

- A dramatic gain in programmer productivity of 42% was claimed by one vendor through the use of dedicated nodal computers (in this instance, an IBM 4331) for groups of about 20 programmers.

- Eliminating turn-round time on program testing was key to this improvement.

- On the same theme another vendor mentioned the successful use of a programmer's workstation.

- Much effort in the industry is being expanded on the development of integrated programming support environments (IPSEs) in order to create situations for more controlled and productive approaches to software development. One vendor commented, "IPSEs are for tomorrow".

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EXHIBIT VIII-7

USAGE OF PRODUCTIVITY TECHNIQUES

Percent of Respondents

■ High Usage   ▨ Low Usage

▨ Medium Usage   ▨ No Reported Use

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4. PROGRAMMING LANGUAGES

- The use of different programming languages for software development by vendors had the following profile:

  - Assembler   8%

  - Traditional high-level languages
    (e.g., COBOL, FORTRAN)   56%

  - Newer high-level languages
    (e.g., PLI, PASCAL, ADA, MODULA-2)   16%

  - Nonprocedural, fourth-generation and other   20%

- Assembler is still used in a surprisingly large number of cases, the reason being that it aids the achievement of performance targets.

- In general, vendors commented that they used whatever languages the client needed or demanded.

- Certainly very little work had been done in new languages like ADA and MODULA-2.

- A widely held belief among vendors is that a good programmer can program in any language, and therefore little thought is given to fixing on a language as a standard.

- As one vendor commented, "no language is a major strategic thrust".

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5.   PROFITABILITY ISSUES

● This area is highly related to the productivity of the programmers who form the vast bulk of the workforce in this market.

● Consequently as for productivity approaches, vendors placed high emphasis on the calibre of their staff as a key to productive and hence profitable work. A vendor commented, "Good people are paramount".

● Vendors were asked to rate three factors for their contribution to overall profitability. The average profile was as follows:

-    Software productivity techniques   22%

-    Project management methods   30%

-    Staff calibre   48%

● It seems clear that this particular segment of the services industry remains closely geared to the individual and is not susceptible in the short-term to "factory" methods.

● Even those companies that have achieved high performance (through the re-use on projects of basic building blocks or modules) still only rated this technique at a 40% contribution.

● For these companies as well, reliance on high calibre staff is still a key ingredient of profitability.

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E.   COMPETITIVE ANALYSIS

- Exhibit VIII-8 ranks the leading ten companies offering professional services within the four major European countries during 1983.

- The professional services market is relatively fragmented with few vendors able to command a substantial share of any one country market.

- The top ten vendors account for around one-third of the total market in France, Italy and West Germany. The exception is the U.K. where the top ten control only 20% of the market.

- Finsiel is notable for its substantial share of the Italian market (15%) and Cap Gemini Sogeti for its substantial share of the market in France (7.6%).

- Also of note is the Scicon International Group, which has built a significant presence in three of the country markets with leadership in the U.K. with Scicon U.K., in West Germany with SCS and in France with GFI.

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EXHIBIT VIII-8

TOP VENDOR RANKING AND SECTOR MARKET SHARES 1983
- PROFESSIONAL SERVICES

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
FRANCE			ITALY		
1	Cap Gemini Sogeti	7.6%	1	Finsiel	15.0%
2	SG2	5.6	2	Syntax	3.8
3	SEMA	3.8	3	Data Management	2.2
4	Sesa	3.2	4	Sopin	2.1
5	CISI	3.1	5	GE-DA	1.9
6	Syseca	2.6	6	O-DATI	1.8
7	Steria	1.9	7	CDS	1.8
8	Sopra	1.8	8	GEISCO	1.3
9	Answare	1.6	9	Systems & Management	1.1
10	GFI	1.5	10	Selesta	0.8
U.K.			WEST GERMANY		
1	Scicon	2.4%	1	SCS	6.1%
2	SDL	2.3	2	Software AG	6.0
3	Hoskyns	2.3	3	Kienbaum	4.1
4	EDS	2.3	4	Roland Berger	3.0
5	SPL	2.1	5	ADV/ORGA	3.0
6	Datalogic	1.9	6	GEI	2.9
7	CAP	1.7	7	EDV-Ploenzke	2.8
8	Logica	1.6	8	MBP	2.5
9	Atkins	1.6	9	PDV	2.3
10	Thorn-EMI	1.5	10	DATEV	1.8

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IX INTEGRATED SYSTEMS

IX INTEGRATED SYSTEMS

A.   INTRODUCTION

- INPUT's definition of integrated systems excludes those organisations that are primarily computer manufacturers.

- However, as has already been pointed out, distinction between manufacturers and system integration is blurring as major manufacturers seek outside sources for major parts of their product line.

- This blurring of distinction is caused by three principal factors:

  - The increasing need to benefit from high-volume low-cost production.

  - The requirement for using state-of-the-art products as the building blocks of complete systems.

  - The cost and time lag involved in "in-house" R&D.

- An important example of this phenomenon is the rapid growth of Convergent Technologies and the use of its products by such manufacturers as Burroughs and Datapoint to market complete systems.

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- The integrated systems market can be considered as three broad groups:

    - The CAD/CAM market with specialist vendors like Computervision.

    - The small- to medium-priced business system.

    - Other specialist niche markets like banking and finance.

B.   MARKET DEVELOPMENT, 1984-1989

- Exhibits IX-1 through IX-5 show the forecast growth and market size for the integrated systems sector for Western Europe and the four individual country markets between 1984 and 1989.

- The falling cost of hardware will give a strong growth impetus in this sector. Lower costs will increase vendors' margins and thus their opportunity to both increase profits and improve the quality of their products.

- INPUT believes that demand will remain strong for this type of system because users want increasingly specific solutions to particular problem areas, e.g., manufacturing control and large project control.

- The potential scope for the application of integrated systems is also increasing as the price of hardware falls. Integrated systems provide users with "surprise-free" implementation.

- System integrators are being helped by:

    - Increased availability of third-party maintenance (TPM).

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EXHIBIT IX-1

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1989
- WESTERN EUROPE

	MARKET FORECAST ($ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
System Hardware	$ 944	$1,120	18%	$1,534	9%	$2,013
Software and Other Charges	621	827	37	1,598	39	4,272
Subtotal	$1,565	$1,947	26%	$3,132	26%	$6,285

INPUT
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EXHIBIT IX-2

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1989
- FRANCE

	MARKET FORECAST (French Francs (FF) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
System Hardware	2,920FF	3,730FF	24%	5,512FF	16%	8,527FF
Software and Other Charges	1,930	2,680	43	5,636	43	16,626
Subtotal	4,850FF	6,410FF	32%	11,148FF	31%	25,153FF

INPUT

EXHIBIT IX-3

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1989
- ITALY

	MARKET FORECAST (Lira (£) Billions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
System Hardware	£234	£324	32%	£ 544	18%	£ 904
Software and Other Charges	145	225	51	495	48	1,600
Subtotal	£379	£549	40%	£1,039	34%	£2,504

INPUT

EXHIBIT IX-4

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1989
- UNITED KINGDOM

	MARKET FORECAST (£ Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
System Hardware	£173	£205	16%	£273	5%	£ 315
Software and Other Charges	120	167	37	310	39	830
Subtotal	£293	£372	26%	£583	25%	£1,145

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MARE

EXHIBIT IX-5

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1989
- WEST GERMANY

	MARKET FORECAST (Deutsche Marks (DM) Millions)					
	1983	1984	1983-1986 AAGR (Percent)	1986	1986-1989 AAGR (Percent)	1989
System Hardware	680DM	795DM	14%	1,001DM	6%	1,200DM
Software and Other Charges	435	575	35	1,080	36	2,720
Subtotal	1,115DM	1,370DM	23%	2,081DM	23%	3,920DM

INPUT
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- Increased hardware product availability leading to more precise system configuration in specialised market niches (greater flexibility).

- This market could, however, be affected (in revenue terms) by overaggressive price reductions in line with falling hardware costs. Value pricing is, therefore, going to become more important.

- Some integrated system vendors are beginning to offer their products directly as a processing service or as an independent software product.

- This type of development could adversely affect the overall growth of the industry, but on balance it is thought likely to increase it.

- The widening opportunities to "add-value" to basic system components and build comprehensive system solutions will help this market to grow at around 26% per annum.

C. USER ATTITUDES

- Thirteen of the total sample of 64 users gave a satisfaction rating for integrated systems.

- As was seen in Exhibit V-10, the overall satisfaction rating given by these users was 3.2 which compares with the average satisfaction level of 3.5 for all services.

- The vast majority of the users (10 of the 13) rated their overall satisfaction as medium, two rated their satisfaction as high and only one gave their system a low rating.

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- The comments made by users indicated that the most prevalent concern related to achieving a good "fit" of the system to their own particular needs.

- On this subject one user commented, "It is still very difficult to end up with the product the user wants".

- Another user commented that in choosing an integrated system, he was attempting to obtain a "surprise-free" implementation.

- Several users were very complimentary about the systems that they had acquired indicating that many of these systems do meet users needs very closely.

- One other problem area indicated by users lay in the domain of system testing where problems had been encountered.

- Several criticisms of documentation were also made.

- Overall satisfaction, however, compared to previous INPUT assessments of this area, showed considerable improvement, indicating a general increase in the quality of the systems and the marketing professionalism of the vendors.

- Some of the reasons for this improvement can be attributed to:

    - Increased availability of reliable third-party maintenance contractors.

    - Wider availability of products on the market leading to greater likeli-hood of meeting the individual user's requirements.

    - More cost-effective hardware components giving greater flexibility to the system integrator.

INPUT

D. VENDOR ISSUES

- Twenty-five out of the total sample of 56 vendors interviewed reported some activity in the integrated systems sector. Of these, 20 completed the hardware services module of the questionnaire.

- Only one of these vendors was primarily dedicated to this particular marketplace, the remainder were mixed services suppliers offering a range of computer services, including processing services.

I. ENGINEERING FACILITIES AND MANUFACTURING POLICY

- Five of the 20 vendors employed their own manufacturing facilities. Of the remainder only eight employed no engineering facilities of their own.

- The other six were involved in hardware integration, commissioning or maintenance to some extent.

- Where the vendor was the subsidiary of another larger company with related activities then it was often the case that hardware-related activities were subcontracted to that organisation.

- Reasons given by the system integrators interviewed for having their own in-house manufacturing or engineering capability included:

    - Adapting a processor for the commercial environment.

    - Addition of selected peripherals to make the product more suitable for a particular vertical market.

    - Exploitation of the "quirks" in the original manufacturer's configuration, for example being able to offer greater flexibility in the choice of peripheral devices.

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- Maximisation of the added-value element.

- The average split between "in-house" manufacture and "brought-in" for the sample interviewed was:

  - Made in-house   18%

  - Brought-in   82%

- Several vendors reported "brought-in" percentages of 100%, while the highest recorded percentage of "made in-house" was 70%.

- This company was one of the five that stated that they still operated a policy of vertical integration.

- However the general trend noticeable from vendors was towards an increasing percentage of "brought-in" components.

- Reasons given for this related primarily to the increasingly higher expenditure required on research and development to remain competitive and provide leading-edge products.

2.   INVESTMENT

- An important concern for information services companies in the integrated systems sector is the level of investment they must make to establish themselves in the business.

- Some vendors, for example, attempt to limit their investment to that required for in-house needs. Many others must cover finished inventory and work in progress in order to meet their commercial commitments.

INPUT

- Approximately 40% of the vendors interviewed provided up-front investment for both pre-sales stocks of complete systems and stocks of spares.

3. WARRANTY AND MAINTENANCE

- Nine of the vendors interviewed provided warranty of some kind for their systems on both hardware and software.

- The period covered varied from as little as 30 days up to one year. Typically the period offered was three months.

- The general view of many vendors was that warranty was an optional extra that they were willing to provide to the customer simply by bundling the relevant maintenance charges into the overall cost of the system.

- Interestingly, one large integrated system vendor offered warranty on only one of its product lines. A standard maintenance contract was available for the other products.

4. BUSINESS DEVELOPMENT AND PROFITABILITY

- There is no question that the integrated systems market is an area of high interest for all participants in the information industry.

- Typical vendor comments were:

  - "We are becoming more involved, we see it as an area of opportunity".

  - "More emphasis will be placed on this area in the future".

- The fundamental reason for the growth of this market will be that more and more opportunities will emerge to "add-value" (and thus earn profits) by taking system components and integrating them into solution-oriented systems.

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- These opportunities are increasing because the user community is demanding more specialised systems.

- More widespread knowledge and experience of computers and increased availability through cost reduction of basic hardware components are making this possible.

- INPUT recommends that services companies evaluate their integrated system enterprises carefully with the aim of maximising their value-added opportunities.

- This does not necessarily imply increasing the degree of vertical integration.

- Key areas of expertise and knowledge need to be identified and used as the basis of sound future strategies.

- Product and service factors that positively differentiate a vendor's market offering from the competition must be emphasised. This type of strategic approach maximises profitability.

- Unique product benefits and a strong service element are strengths that competitors find impossible to respond to in the short term and difficult and expensive to respond to in the long term.

E.   COMPETITIVE ANALYSIS

- Exhibit IX-6 shows the leading ten independent vendors of integrated systems ranked in each of the four individual country markets.

INPUT

EXHIBIT IX-6

TOP VENDOR RANKING AND SECTOR MARKET SHARES 1983
- INTEGRATED SYSTEMS

RANK	VENDOR	MARKET SHARE	RANK	VENDOR	MARKET SHARE
FRANCE			ITALY		
1	Steria	2.6%	1	SICIT	2.6%
2	Computervision	1.8	2	SSS	1.5
3	Telesystemes	1.7	3	Datamat	1.2
4	Intergraph	1.6	4	Data Management	0.9
5	CALMA	1.6	5	SIO-TS	0.6
6	Gerber	1.4	6	Sele Informatica	0.6
7	SEMA	1.3	7	CNI	0.5
8	SESA	0.8	8	FIMA	0.5
9	Applicon	0.7	9	HOMIC	0.5
10	AMI	0.6	10	Diecinque	0.4
U.K.			WEST GERMANY		
1	Systime	11.7%	1	Computervision	5.8%
2	Arbat	4.0	2	Taylorix	4.0
3	Computervision	3.9	3	Intergraph	3.0
4	Metier	2.8	4	Gerber	2.5
5	CAP	2.4	5	CALMA	2.5
6	THORN-EMI	2.0	6	Applicon	1.3
7	Hoskyns	1.9	7	ACI-UCCEL	1.1
8	Logica	1.6	8	IKOSS	1.0
9	Scicon	1.5	9	GSI (Datel)	0.9
10	SDL	1.4	10	Metier	0.8

- The integrated systems market remains very fragmented with only Systime in the U.K. achieving an individual country market share in excess of 10%.

- As a result, the U.K. is the only market in which the top ten achieve a significant market position (around one-third). The top ten vendors account for nearly 23% of the total market in West Germany but only 14% in France and 9% in Italy.

- CAD/CAM suppliers are a group of significant vendors in this market-- Computervision, for example, being represented in three of the four countries' top ten rankings and achieving market leadership in West Germany.

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APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- <u>INFORMATION SERVICES</u> - The provision of:

  - Data processing functions using vendor computers (processing services).

  - The provision of data base access where computers perform an essential role in the processing or conveyance of data.

  - Services that assist users to perform functions on their own computers (software products and/or professional services).

  - A combination of hardware and software, integrated into a total system (integrated systems).

A.   <u>REVENUE</u>

- All revenue and user expenditures reported are available (i.e., noncaptive) revenue, as defined below.

- <u>NONCAPTIVE INFORMATION SERVICES REVENUE</u> - Revenue received for information services provided within the four Western European country markets of France, Italy, the U.K., and West Germany from users who are not part of the same parent corporation as the vendor.

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- CAPTIVE INFORMATION SERVICES REVENUE - Revenue received from users who are part of the same parent corporation as the vendors.

- OTHER REVENUE - Revenue derived from lines of business other than those defined above.

B. SERVICE MODES

- PROCESSING SERVICES - Remote computing services, batch services, and processing facilities management.

    - REMOTE COMPUTING SERVICES (RCS) - Provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. There are five submodes of RCS:

        . INTERACTIVE (timesharing) - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing but also for data entry and transaction processing: the user is on-line to the program/files.

        . REMOTE BATCH - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

        . DATA BASE - Characterized by the retrieval and processing of information from a vendor-provided data base. The data base may be owned by the vendor or a third party.

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- **USER SITE HARDWARE SERVICES (USHS)** - These offerings provided by RCS vendors place programmable hardware on the user's site (rather than in the EDP center). USHS offers:

  - Access to a communications network.

  - Access through the network to the RCS vendor's larger computers.

  - Significant software as part of the service.

- **BATCH SERVICES** - This includes data processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunication media) to and/or from those sites. Data entry and data output services, such as keypunching and computer output microfilm processing, are also included. Batch services include those expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.

- **PROCESSING FACILITIES MANAGEMENT (PFM)** (Also referred to as "resource management" or "systems management") - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To qualify as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.

- Processing services are further differentiated as follows:

  - Function-specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable,

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INPUT

payroll, and personnel applications fall into this category. Function-specific data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry specific.

- Industry-specific services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" that the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry specialty applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

- Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables users to develop their own problem solutions or processing systems. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- SOFTWARE PRODUCTS - This category includes users' purchases of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' sites. Fees for work performed by organizations other than the package vendor are

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counted in professional services. There are several subcategories of software products.

- APPLICATIONS PRODUCTS - Software that performs processing to service user functions. They consist of:

  - CROSS-INDUSTRY PRODUCTS - Used in multiple user industry sectors. Examples are payroll, inventory control, and financial planning.

  - INDUSTRY-SPECIFIC PRODUCTS - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

- SYSTEMS PRODUCTS - Software that enables the computer/communications system to perform basic functions. They consist of:

  - SYSTEMS CONTROL PRODUCTS - Function during applications program execution to manage the computer system resource. Examples include operating systems, communication monitors, emulators, and spoolers.

  - DATA CENTER MANAGEMENT PRODUCTS - Used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

  - APPLICATION DEVELOPMENT PRODUCTS - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, data base

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management systems, report writers, project control systems, and retrieval systems.

- PROFESSIONAL SERVICES - Made up of services in the following categories:

  - EDUCATION SERVICES - EDP products and/or services - related to corporations, not individuals.

  - CONSULTING SERVICES - EDP management consulting and feasibility studies, for example.

  - SOFTWARE DEVELOPMENT - Including system design, contract programming, and "body shopping."

  - PROFESSIONAL SERVICES FACILITIES MANAGEMENT (PSFM) - The counterpart to processing facilities management, except that in this case the computers are owned by the client, not the vendor; the vendor provides people to operate and manage the client facility.

- INTEGRATED SYSTEMS (Also known as Turnkey Systems) - An integration of systems and applications software with hardware, packaged as a single entity. The value added by the vendor is primarily in the software. Most CAD/CAM systems and many small business systems are integrated systems. This does not include specialized hardware systems such as word processors, cash registers, and process control systems.

- Integrated systems revenue in this report is divided into two categories.

  - INDUSTRY-SPECIFIC systems, i.e., systems that serve a specific function for a given industry sector such as seismic processing systems, automobile dealer parts inventory, CAD/CAM systems, discrete manufacturing control systems, etc.

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- <u>CROSS-INDUSTRY</u> systems, i.e., systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, personnel management systems, etc.

- Revenue includes hardware, software, and support functions.

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INPUT

APPENDIX B: INTERVIEW AND SAMPLE PROFILE

APPENDIX B: INTERVIEW AND SAMPLE PROFILE

A.   VENDORS

- The vendor sample included significant information services vendors in each of the four country markets. In many cases these vendors offered a combination of services from amongst the four major sectors defined by INPUT as:

    - Processing services.

    - Software products.

    - Professional services.

    - Integrated systems.

- In total 56 vendor organisations were interviewed, 43 on an in-depth face-to-face basis. The remainder responded to a mailed questionnaire.

- The profile of organisation type is shown in Exhibit B-1.

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EXHIBIT B-1

PROFILE OF VENDOR INTERVIEWS

	PROCESSING SERVICES	SOFTWARE PRODUCTS	PROFESSIONAL SERVICES	INTEGRATED SYSTEMS	TOTAL NUMBER OF COMPANIES
France	10	10	9	8	13
Italy	10	10	12	5	15
United Kingdom	11	10	17	8	20
West Germany	6	4	6	4	8
Totals	37	31	44	25	56

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B.   USERS

- The user respondent sample analysis by country is given below:

France	10
Italy	15
United Kingdom	21
West Germany	<u>18</u>
Total	64

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APPENDIX C: VENDOR QUESTIONNAIRE

VENDOR QUESTIONNAIRE

1. Company Background Data

    A. Company Name/Main Location:

    Company Name: _____

    Address: _____

    _____

    Telephone Number: _____   Telex: _____

    B. Staff Numbers

    Total Group: _____

    Total this Country: _____

    Of Which:

    Analysts/Programmers   _____

    Operating   _____

    Engineering/Support   _____

    Marketing/Sales   _____

    C. Acquisitions/Divestitures/Joint Agreements

    Please give details of any acquisitions, divestitures, or joint agreements made during the past two years:

    _____

    _____

    _____

    _____

    _____

    _____

INPUT

2. Company Revenues

   A. Financial Data (Local Currency Please)

       Total Revenue Financial Year Ending _____/_____/_____

REVENUE	YEAR BEFORE LAST 1982		LAST YEAR 1983		CURRENT YEAR (Predicted) 1984	
	Revenue	Captive %	Revenue	Captive%	Revenue	Captive %
Domestic						
Export Europe						
Outside Europe						
Total Group						

Could you please let us have a copy of your annual report or published financial data?

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B. Breakdown of Revenue

Please give breakdown or revenue or percentage for last year (1983) and your estimate for 1984.

	DOMESTIC		EXPORT EUROPE	
	1983	1984 Est.	1983	1984 Est.

Remote Computing:
    Interactive
    Remote Batch
    On-Line Database				

Batch Services				
Facilities Management (FM)				
User Site Hardware Services (Including Terminal/Personal Computer Rental and Sales)				

Software Products:
 	
Application
    - Industry Specialised
    - Cross-Industry
System
    - System Control
    - Data Centre Management
    - Applications Development				

Professional Services;
 	
    Education and Training
    Consulting Services
    Tailored S/W Development
    Facilities Management
        (Personnel Only)				

Integrated Systems;
    Industry Specialised   - M/F
                        - Mini
                        - Micro
    Cross-Industry   - M/F
                        - Mini
                        - Micro				

Hardware Maintenance				
Other (Please Specify)				

INPUT

Have you any comments on changes in the future to this pattern, e.g. more emphasis on sales to the U.S. market?

_____

_____

_____

3. Computer Hardware Installed

Please specify the hardware that you have installed by supplying the NAME, MODEL, QUANTITY and MODE OF USE (Prime function), PRODUCTION, DEVELOPMENT, AND COMMUNICATIONS.

MODEL TYPE Mainframes/Minis	Quantity Now Installed	MODE OF USE		
		Production	Development	Communications
MICROS/PERSONAL COMPUTERS (Usually on Customer Sites) (Please Indicate Average Hardware Price per System)	Quantity Installed During 1983			
TERMINALS (Please Also Give Number of Terminal Sites)				

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4. **Key Products and Services Actively Promoted**

    Please describe the name and function of products and/or services which form the most important part of current business.

    _____

    _____

    _____

    Could you please let us have a copy of any brochures or sales material on these products and services.

5. **Industry Trends**

    What is your level of commercial interest in the following areas on the potential development of services?

		High	Medium	Low
A.	On-line database (Including VIDEOTEX)	☐	☐	☐

    Comments: _____

    _____

    | B. | Multiple delivery modes for software (e.g., PC, RCS, Mainframe) | ☐ | ☐ | ☐ |

    Comments: _____

    _____

    | C. | Fourth-Generation Languages | ☐ | ☐ | ☐ |

    Comments: _____

    _____

    | D. | Support of Professionals (e.g., Small Scale Relational Database) | ☐ | ☐ | ☐ |

    Comments: _____

    _____

    | E. | Decision Support Systems | ☐ | ☐ | ☐ |

    Comments: _____

    _____

INPUT

		High	Medium	Low
F.	Knowledge Based Systems/Expert Systems	☐	☐	☐

Comments: _____

_____

G.	Educational/Training Software	☐	☐	☐

Comments: _____

_____

H.	Software Development Productivity Services	☐	☐	☐

Comments: _____

_____

I.	Personal Computers	☐	☐	☐

Comments: _____

_____

J.	New Languages/Operating Systems (e.g., ADA, UNIX)	☐	☐	☐

Comments: _____

_____

6. Processing Services

What is your experience and what is your expectation with regard to the following aspects of your processing services business?

A. Change from previous year in composition of revenues:

	1983		1985	
	RCS	BATCH	RCS	BATCH
– Function-Specific	☐	☐	☐	☐
– Industry-Specific	☐	☐	☐	☐
– Utility Services	☐	☐	☐	☐
	100%	100%	100%	100%

Comment: _____

_____

INPUT

B. Percent of accounts lost as a result of a move to:

- Stand-Alone Mini ☐%

- Stand-Alone Micro/Personal Computer ☐%

- Connection to In-House Network ☐%

- Batch Processing on In-House Mainframe ☐%

Comments: _____

_____

C. Are you experiencing a change from large to small account business:
Yes ☐ No ☐   1983   1985 Est.

- Percent Accounts   ☐   ☐

- Small Accounts   ☐   ☐
                                                100%   100%

D. Emphasis on User-Site Hardware Services

(Rate as High, Medium, or Low)   1983   1985

- Non PC-Based   ☐   ☐

- PC-Based   ☐   ☐

Comments: _____

_____

E. Facilities Management – Do you think there is/will be a need for bureaux to offer complete packaged contracts including hardware, software, operators, etc?

- Now   Yes ☐ No ☐

- In 2 Years' Time   Yes ☐ No ☐

F. Are you considering retailing your services through 3rd parties

- Now   Yes ☐ No ☐

- In 2 Years' Time   Yes ☐ No ☐

Comments: _____

_____

INPUT

G. What method(s) of pricing do you use for processing services?

RCS _____

_____

Batch _____

_____

H. Have these methods changed over the last 2 years and do you expect any change in the next 2 years?

RCS _____

_____

Batch _____

_____

I. May we have a copy of your current services tariff structure/price list?

Yes   No

J. Over how many accounts/sales do you normally expect to recover software procurement/development costs?

- Application Packages _____

- Utilities _____

K. What percentage of your software do you obtain from the sources below?

	Use Manufacturer's	Buy	Build
- System Software	☐	☐	☐
- Applications	☐	☐	☐
- Utilities	☐	☐	☐

Comments: _____

_____

_____

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L. To what extent have your recent profits been bolstered by external or temporary factors, e.g., by:

	High	Medium	Low
- Already Depreciated Equipment	☐	☐	☐
- Falling Hardware Costs	☐	☐	☐
- Price Increases Matching Inflation	☐	☐	☐
- Other (Please Specify) _____	☐	☐	☐

Comments: _____

_____

7. Software Products

A. What are your three most heavily used products? (Please state whether based on micro/mini/SBS or mainframe)

Approximate Number
of Installations

I _____ ☐

II _____ ☐

III _____ ☐

B. What growth rates have you experienced from your software products and what do you anticipate they will be in 2 years' time? _____

_____

_____

C. If you have experienced fast expansion, has this impacted profitability?

_____

_____

D. Over how many systems/sales do you normally expect to recover software development costs?

- Systems Software ☐

- Applications Packages ☐

- Utilities ☐

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INPUT

E. Is your new business more costly to obtain than in the past? Yes☐ No☐

F. Support/servicing activities are crucial to productivity. Do you use or are planning to use:

-   Phone-In Support Centres   Use☐   Plan☐   No☐

-   Remote Diagnose/Fixing On-Line   Use☐   Plan☐   No☐

    If neither, how else do you expect to contain escalating personnel costs?

    _____

    _____

G. What approach do you take to software product pricing? _____

    _____

    _____

    _____

H. If you are independent, what competition do you anticipate from manufacturers' products?

    Decreased☐   The Same☐   Increased☐

    Comments: _____

    _____

I. How do you anticipate countering competition from manufacturers? _____

    _____

    _____

J. What marketing/sales methods are you using to promote and sell your software products? _____

    _____

    _____

K. May we have a copy of your current price list? Yes☐ No☐

INPUT

8. Professional Services

A. What types of contract do you offer:

	Yes	No
- Fixed Price	☐	☐
- Time and Materials	☐	☐
- Body Hire	☐	☐
- Other (Please Specify) _____		

Comments: _____

_____

B. What productivity aids/methods do you employ: (Rate using High, Medium, Low)

- Structured Techniques e.g., M. Jackson	☐
- Reusability of Modular Code	☐
- Improved Languages	☐
- Application System Generators	☐
- Personal Motivation	☐
- Other (Please Specify) _____	☐

Comments: _____

_____

C. What factors contribute to your profitability?   Cont. Percent

- Software Productivity Techniques	☐
- Project Management Methods	☐
- Calibre of your Staff	☐
- Other (Please Specify) _____	☐
	100%

Comments: _____

_____

INPUT

D. Do you employ freelance staff (or subcontract work out) on any of the following grades?

	Sometimes	Often	Never
– Specialist Consultants	☐	☐	☐
– Analysts & Programmers	☐	☐	☐
– Operators	☐	☐	☐
– Others (Please Specify) _____	☐	☐	☐

Comments: _____

_____

E. What approximate percentages of your software is developed using the following languages:

- Assembler _____ %

- Traditional High-Level – COBOL, FORTRAN, BASIC ALGOL 60 RPG _____

- Newer High-Level e.g., – PL1, CORAL 66, RTL2, PASCAL, APL, ADA, MODULA -2 _____

- Non-Procedural e.g., Query Languages, Non-Host DBMS _____

- Other (Please Specify) _____ _____

100%

Comments: _____

_____

F. What trends in consultancy assigments are you noticing?

	Yes	No
– General Implementation Advice	☐	☐
– Equipment Selection	☐	☐
– Specialist – Performance Measurement	☐	☐
– Feasibility	☐	☐
– Other (Please Specify) _____	☐	☐

Comments: _____

INPU

9. Hardware Services (System Integrator, Turnkey Services, Distributors, Third Party Maintenance, "TPM")

A. Do you provide your own hardware/engineering facilities?

If so, are they used for: Yes   No

- Manufacture ☐ ☐

- Integration ☐ ☐

- Commission ☐ ☐

- Maintenance ☐ ☐

- Other (Please Specify) _____ ☐ ☐

Comments: _____

_____

B. Do you have a policy of vertical integration of systems? (i.e., make as much as possible yourself of a product of line)   Yes ☐   No ☐

What is percentage breakdown of systems cost between 'made in-house' and 'brought in-house'? Made In-house _____% Brought In-House _____%

Comments: _____

_____

C. Do you provide up-front investment for system cost components?

                                   Yes   No

- Software Products - System ☐ ☐

- Software Products - Application ☐ ☐

- Hardware Systems, Pre-Sale Stock ☐ ☐

- Spares Stock ☐ ☐

- Other _____ ☐ ☐

Comments: _____

_____

_____

- 201 -

INPUT

D.   Do you offer warranty? And for what period on?

	Yes	No
– Hardware	☐	☐
– Software	☐	☐

Comments: _____

_____

E.   What trends are you noticing within the area of hardware services?

_____

_____

_____

_____

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

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VENDOR QUESTIONNAIRE

(Supplementary Questions)

1. Industry Expertise

A. Please indicate the percentage of your 1983 revenue obtained and the marketing of industry-specific products if any in the following industry sectors:

	Revenue %	Products
- Discrete Manufacturing	☐	☐
- Process Manufacturing	☐	☐
- Transportation	☐	☐
- Utilities	☐	☐
- Banking/Finance	☐	☐
- Insurance	☐	☐
- Medical	☐	☐
- Education	☐	☐
- Retail Distribution	☐	☐
- National Government	☐	☐
- Local Government	☐	☐
- Services	☐	☐
- Other	☐	☐

INPUT

B. Application Areas. Please indicate the percentage of your 1983 revenue obtained, and the marketing of cross-industry software/system product(s) in the following application areas.

APPLICATION AREA	Revenue %	Product
Industrial/Military Control Systems	☐	☐
Engineering/Technology	☐	☐
Order Proc./Purchasing/Point of Sale	☐	☐
Production/Inventory Control/Manufacturing	☐	☐
Distribution/Transport	☐	☐
Marketing/Sales	☐	☐
Payroll/Personnel	☐	☐
Accounting/Costing/Audit	☐	☐
Financial Analysis/Planning	☐	☐
Portfolio/Asset/Cash Management	☐	☐
Office Automation/Administration/Communication	☐	☐
Database Services	☐	☐
Data Communications	☐	☐
Other Utility e.g., System Development	☐	☐

INPUT

C. Hardware - Software Environment.

Please indicate below the percentage of your 1983 revenue obtained in the major Hardware - Software Environment within which you operate or offer services:

	% Revenue	Type of Hardware	Operating System
Mainframe			
Mini			
Micro			

2. Common Issues

A. Are you placing emphasis in product development (applications) more into Cross-Industry (X) products or Industry-Speciality (IS) products or is it about equal?   ☒X   ☒IS   ☒=

What will the percentage split be in 2 years? ☐ ☐

What will the percentage split be in 5 years? ☐ ☐

Comments: _____

_____

B. Is your average revenue per customer declining (so leading to increased unit sales cost)?   Yes ☐   No ☐

Comments: _____

_____

C. Do your strategic plans take into account the possibilities of:

	Yes	No
- Continuing Inflation (If so please specify how)	☐	☐
- Continued Recession (If so, specify impact)	☐	☐
- Economic Expansion (If so, specify impact)	☐	☐

Comments: _____

INPUT

D. Is staff shortages a real or perceived obstacle to your growth?

Real ☐ Perceived ☐ No Problem ☐

If so, which grades (Please rate impact; High, Medium, Low)

Sales ☐

Sales Support ☐

Software Professionals ☐

Operations Staff ☐

Technical Support/Engineers ☐

Managerial ☐

Other (Please Specify _____

E. Which are your three most serious competitors?

1 _____ 2 _____ 3 _____

F. Do you see a need for mergers between companies in the industry?

_____

_____

G. Are you as a company seeking to acquire new businesses or divesting from existing ones?

_____

_____

H. Do you see a need for joint marketing agreements or other partnership arrangements?

_____

_____

I. Do you anticipate that you will expand geographically in the near future?

_____

_____

INPUT

3. European Communications Environment

   A. Do you see your growth adversely affected by PTT Monopoly positions?

      - Short term i.e., over next 2 years   Yes ☐ No ☐

      - Long term i.e., over next 5 years   Yes ☐ No ☐

   B. Which aspects impact your business most: (Please rate severity of impact, High, Medium, Low, Negative, i.e., good for you)

      - Tariff increases   ☐

      - Provision of Leased lines degraded (i.e., nos. quality, servicing etc., poorer   ☐

      - Trans-Border Data Flow Obstructed by Legislation or Restrictive Practices   ☐

      - Network Connections More Rigorously/Legalistically Vetted   ☐

      - Increased Competition from Public Data Networks (Transpac etc.)   ☐

      - Increased Competition from PTT as Services Suppliers   ☐

      - Videotex Applications   ☐

      - Other (Please Specify) _____   ☐

      Comments: _____

      _____

   C. If your answer to Part "A" was YES, in either part, what are your strategic plans to offset the loss of business?

                            Yes   No

      - To Diversify into Other Areas   ☐   ☐

      - Try to Improve Your Own Competitive Edge   ☐   ☐

      - Other (Please Specify) _____   ☐   ☐

      Comments: _____

      _____

      _____

INPUT

D. Do you expect to enhance your product range within the next 2 to 5 years by adding one or more of the following services to your repertoire:

	Yes, Within:		Already	
	2 Years	5 Years	No	Do
Addition of a Network to Your Bureau Centres	☐	☐	☐	☐
Use of Public Data Networks (PDNs) to Offer Added-Value Services	☐	☐	☐	☐
Offering VIDEOTEX Type Services	☐	☐	☐	☐
Use of Euronet-Diane for Supply of Database Services	☐	☐	☐	☐
Offering Database Services by some Other Mea..s	☐	☐	☐	☐

Comments: _____

_____

E. Do you see opportunities for computer services in connection with 'Office of the Future' business communications?

If so, in connection with:	Yes	No
- User-Site Word-Processing Centres/Networks	☐	☐
- Electronic Mail	☐	☐
- Fascsimile/Telecopier	☐	☐
- Image Processing Systems/CRT Graphics	☐	☐
- Multi-Function Equipment e.g. Intelligent PABX	☐	☐

Comments: _____

_____

_____

INPUT

APPENDIX D: USER QUESTIONNAIRE

USER QUESTIONNAIRE

(Please use local currency where applicable)

GENERAL INFORMATION

1. Primary business _____

2. Industry code(s) – SIC (if known) _____

3. Total number of employees _____

4. Number of DP employees _____

5. Annual Revenue _____ or

6. Assets _____

7. If size is measured by some other scale, please indicate _____

   Are the above statistics for:

8.   Division/subsidiary? or

9.   Total corporation?

10. If division/subsidiary, what is corporate size? _____

INPUT

11. What are your primary objectives and priorities for the next three years? (Rank the top five in order of importance: 1 through 10, 1 being most important, 2 second, etc., for each of the three years.)

CATEGORY	PRIORITY RANKING		
	1984	1985	1986
Convert applications	_____	_____	_____
Change Operating System	_____	_____	_____
Develop new batch applications	_____	_____	_____
Install on-line applications	_____	_____	_____
Design/install DBMS	_____	_____	_____
Design/install DDP network	_____	_____	_____
Install new mainframe	_____	_____	_____
Install minicomputers/small business systems	_____	_____	_____
Install personal computers	_____	_____	_____
Install new peripherals	_____	_____	_____
Install office automation	_____	_____	_____
Use fourth-generation languages	_____	_____	_____
Develop Information Centre	_____	_____	_____
Centralize DP Control	_____	_____	_____
Decentralize DP Control	_____	_____	_____
Develop long-range DP plan	_____	_____	_____
Meet development/conversion schedules	_____	_____	_____
Improve DP personnel productivity	_____	_____	_____
Integrate office automation with DP	_____	_____	_____
Other (please specify and indicate priority)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

INPUT

12. Has your budget been affected by the possibilities of recession?

☐ Yes ☐ No Recovery? ☐ Yes ☐ No

13. If yes, by what percent _____% and in what areas? _____

DP PROBLEMS

14. What are the most significant DP problems you face in 1984 (Rank the top five in order of priority: 1 through 10, 1 being most urgent, 2 second etc.)

CATEGORY	PRIORITY RANKING 1984
Personnel recruiting	_____
Personnel training	_____
Lack of general management understanding	_____
Lack of user involvement in system/ application development	_____
Inadequate systems software	_____
Need for improvement in operations	_____
Need for better planning and control	_____
Excessive applications development time	_____
Excessive applications backlog	_____
Inadequate DP funding (budgets)	_____
Need to improve data communications facilities	_____
Unsatisfactory hardware maintenance	_____
Other (please specify and indicate priority)	_____
_____	_____
_____	_____
_____	_____

Comments:_____

_____

_____

_____

INPUT

DP APPLICATIONS

15. What new applications will you be developing (or purchasing) during 1984? What is their mode of operation and relative importance in your total development effort? (Rank new applications in order of importance: 1 through 10, being most important, 2 second etc. Please also indicate (tick) application areas already implemented under "Existing".)

	New Development	Primary Mode of Operation (tick one)		Source (tick one)		
	Priority Ranking	Central Site	Remote Site	In-house Development	Outside Purchase	Existing Applications (tick)
Industrial/Manufacturing control systems	_____	_____	_____	_____	_____	_____
Engineering/design/R&D	_____	_____	_____	_____	_____	_____
Order entry/billing/purchasing/ point of sale	_____	_____	_____	_____	_____	_____
Production/inventory control	_____	_____	_____	_____	_____	_____
Distribution/transport	_____	_____	_____	_____	_____	_____
Marketing/sales	_____	_____	_____	_____	_____	_____
Personnel/payroll	_____	_____	_____	_____	_____	_____
Accounting/finance	_____	_____	_____	_____	_____	_____
Other (please specify)						
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

DP BUDGET

16. What is your total DP budget for 1984? _____

17. Does your budget include data communications, software product, training, supplies, etc?

☐ Yes   ☐ No

18. If no, what item(s) are not included in your budget? _____

_____

19. Has your budget been affected by the continuation of inflation?

☐ Yes   ☐ No

INPUT

20. In yes, by what percent _____ % and in what areas? _____

_____

21. Please categorize how your 1984 DP budget will be spent and how this breaks down between central and remote sites. Also indicate how much you expect specific categories to increase or decrease in 1985.

BUDGET CATEGORIES	1984 Total Budget			Anticipated Percent of Change in 1985	
	Amount (Local Currency)	Percent Central	Percent Remote	Increase	Decrease
Personnel (including recruitment, training, etc.)	_____	_____ %	_____ %	_____ %	_____ %
Mainframe processors	_____	_____ %	_____ %	_____ %	_____ %
Peripherals	_____	_____ %	_____ %	_____ %	_____ %
Minicomputers	_____	_____ %	_____ %	_____ %	_____ %
Personal computers	_____	_____ %	_____ %	_____ %	_____ %
Terminals	_____	_____ %	_____ %	_____ %	_____ %
Office Automation equipment	_____	_____ %	_____ %	_____ %	_____ %
Communications hardware and software	_____	_____ %	_____ %	_____ %	_____ %
Software (purchase or lease)	_____	_____ %	_____ %	_____ %	_____ %
Vendor maintenance services (hardware and software)	_____	_____ %	_____ %	_____ %	_____ %
Processing services (outside)	_____	_____ %	_____ %	_____ %	_____ %
Supplies and other	_____	_____ %	_____ %	_____ %	_____ %
_____		_____ %	_____ %	_____ %	_____ %

22. Are any of the expenditures in your budget for turnkey systems which combine hardware and applications for software on a "ready-to-use" basis?

☐ Yes ☐ No If yes, how much will be used for such systems?

_____

INPUT

F. DP HARDWARE

23. Please indicate the number of general-purpose systems installed and on order for central site and remote sites.

No. Located:

Vendor	Series/Model	No. Installed	No. on Order	At Hq.	At Remote Sites

I. Mainframes

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

II. Minicomputers/small business systems

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

III. Personal computers/microcomputers

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

24. How does the DP group plan/control the acquisition and use of equipment in categories:

II. _____

III. _____

25. Please indicate the number of devices installed or planned.

Have You Installed:	No Plans	None, but Planned	Number Installed	Projected Growth 1984-1985
I. Intelligent Terminals	_____	_____	_____	_____ %
II. Non-Intelligent Terminals	_____	_____	_____	_____ %

INPUT

G. OUTSIDE COMPUTER SERVICES AND SOFTWARE EXPENDITURES

26. Does your company purchase outside computer services that are not under the control of the DP organization?

   ☐ Yes   ☐ No

27. If yes, what were the approximate annual expenditures for these services in 1983?

   _____

28. What percent increase or decrease do you expect between 1983-1984 _____ %

   1984-1985 _____ %

29. Who purchases these outside services?

Finance	_____ %	Operations/manufacturing	_____ %
Corporate	_____ %	Marketing/sales	_____ %
Personnel	_____ %	Other (please specify)	
R&D/engineering	_____ %	_____	_____ %

H. SATISFACTION WITH SERVICES AND SOFTWARE SUPPLIERS; AND FUTURE USE

30. Please indicate your level of satisfaction (High, Medium, Low) with different types of service/software, and also give the likely increase/decrease in usage over the next two years.

		SATISFACTION (tick one)			PROJECTED CHANGE 1984-1986	
SERVICE/SYSTEM	Don't Use	High	Medium	Low	Growth (Percent)	Growth (Percent)
Bureau –						
RCS – Interactive	____	____	____	____	_____ %	_____ %
RCS – Remote batch	____	____	____	____	_____ %	_____ %
Batch (incl. COM, OCR)	____	____	____	____	_____ %	_____ %
Facilities management	____	____	____	____	_____ %	_____ %
Turnkey/Integrated systems	____	____	____	____	_____ %	_____ %
Hardware maintenance	____	____	____	____	_____ %	_____ %

INPUT

SATISFACTION WITH SERVICES AND SOFTWARE SUPPLIERS: AND FUTURE USE

30. Continued

| | SATISFACTION (tick one) | | | | PROJECTED CHANGE 1984-1986 | |
	Don't Use	High	Medium	Low	Growth (Percent)	Growth (Percent)
System software products	_____	_____	_____	_____	_____ %	_____ %
Application software products	_____	_____	_____	_____	_____ %	_____ %
Professional Services:	_____	_____	_____	_____	_____ %	_____ %
Consultancy	_____	_____	_____	_____	_____ %	_____ %
Tailored software development	_____	_____	_____	_____	_____ %	_____ %
Education and training	_____	_____	_____	_____	_____ %	_____ %

31. From your present experience of suppliers, please give a comment on the above types of service under four (4) categories set out below. (If you don't use a category insert N/A for Not Applicable):

1. Processing (bureau) services _____

2. Turnkey/Integrated systems _____

3. Software products _____

4. Professional services _____

32. Please rank your top three (3) preferred suppliers in order of preference (A = most preferred) for each of the same service categories - (again use N/A for each Non-Applicable category.):

1. Processing Services   A. _____   B. _____   C. _____

2. Turnkey/Integrated systems   A. _____   B. _____   C. _____

3. Software products   A. _____   B. _____   C. _____

4. Professional services   A. _____   B. _____   C. _____

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OFFICE OF THE FUTURE ISSUES

33. Please check which of the communications services and office automation facilities are being used or planned and indicate whether the DP department has management responsibility for them.

CATEGORY	STATUS/PLANS					DP RESPONSIBILITY/PLANS				
	Using It Now	In 1984-1986	In 1987-1989	No Plans	Don't Know	DP Responsibility	In 1984-1986	In 1987-1989	No Plans	Don't Know
Data Communications										
● Dial up										
● Leased line										
● Packet network										
● Telex/TWX										
Database Servcies										
● Public Videotex										
● Private Videotex										
● Euronet-Diane										
● Other										
Office Automation										
● Electronic Mail										
● Word processing										
● Image processing										
● Telecopier/facsimile										
● CRT graphics										

INPUT

DP PURCHASING DECISIONS

34. How would you describe your company's policy on purchasing of computers and related services?

   ● Allow complete automony to operating divisions/subsidiaries _____

   ● Allow automony under certain restricted conditions _____

   ● Stipulate use of a central DP department _____

   ● Other (please specify)_____ _____

   Comment (on choice): _____

   _____

35. In practice who are the __major__ decision makers in the choice of equipment and services?

PURCHASER (tick one per column)	HARDWARE		SOFTWARE		COMPUTING SERVICES		OFFICE AUTOMATION		COMMUNICA-TIONS	
	Head Office	Remote Site	Head Office	Remote Site	Head Office	Remote Site	Head Office	Remote Site	Remote Site	Head Office
DP Director/Manager										
Divisional Managers										
Accountants/Administrators										
End users, e.g., engineers										
Other (specify) _____										

Comments: _____

_____

_____

INPUT

36. Is your organisation becoming more centrally controlled or is it having more local autonomy for DP decisions in the following areas?

Control Becomes:	More Central/ Integrated	More Local/ Autonomous
Use of outside Computing Services		
Office Automation		
Telecommunications		
Use of Personal Computers		

Comments: _____

_____

_____

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London W1V 9PB

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APPENDIX E: RELATED INPUT REPORTS

APPENDIX E: RELATED INPUT REPORTS

- <u>European Marketing Methods that Increase Sales</u>, June 1984.

- <u>European On-Line Database Markets, 1984-1989</u>, October 1984.

- <u>U.S. Information Services Markets, 1984-1989</u>, 1984.

- <u>Personal Computer Opportunities for Remote Computing Services Vendors in Western Europe</u>, November 1983.

- <u>Micro-Mainframe: PC Market Opportunities</u>, 1984.

- <u>Integrated DBMS-Applications Software</u>, 1984.

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